

NOTULAE AD FLORAM AGARICINAM NEERLANDICAM—XVI
New taxa, new combinations in *Melanoleuca* Pat. and notes on rare species
in the Netherlands

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The genus *Melanoleuca* (Pat.) Pat. is divided in three subgenera based on the morphology of the cystidia, viz. (i) subgen. *Macrocyttis*, consisting of the sections *Alboflavidae*, *Cognatae* and *Strictipedes*, (ii) subgen. *Melanoleuca* and (iii) subgen. *Urticocystis* comprising two sections, viz. *Grammopodiae* and *Humiles*.

Melanoleuca brevipes, *M. cognata*, *M. excissa*, *M. grammopodia*, *M. melanoleuca*, *M. polioleuca*, *M. politoinaequalipes*, *M. rasilis*, and *M. turrita* are redescribed. The following new combinations are introduced: *M. excissa* var. *iris*, *M. polioleuca* f. *oreina*, *M. rasilis* var. *leucophylloides*, and *M. rasilis* var. *pseudoluscina*. *Melanoleuca nivea* Métrod (nom. nud.) is validated and the following new taxa are described: *Melanoleuca atripes*, *M. cognata* var. *nauseosa*, *M. grammopodia* f. *macrocarpa* and *M. albifolia*.

During a study of the representatives of the genus *Melanoleuca* in the Netherlands we became aware of the confusing taxonomic knowledge of that genus. Recognizing a *Melanoleuca* as such is generally no problem for experienced agaricologists, but beyond that, many controversies exist concerning the distinction of species and infraspecific taxa and the interpretations of descriptions in old literature, e.g. those of Persoon (1801) and Fries (e.g. 1821).

This problem is complicated by the lack of a modern monograph of the genus and the existence of many short, taxonomically and geographically limited and therefore fragmentary publications. Although this latter holds true also for this contribution, I feel it necessary to publish a part of my observations, because the names of some very well recognizable species described by Métrod have to be validated and a number of new combinations turned out to be required.

In the here following descriptions is referred to three different colour codes: Mu. = Munsell soil colour charts; K. & W. = Kornerup & Wanscher, Methuen handbook of colour; Expo. = Cailleux & Taylor, Code expolaire.

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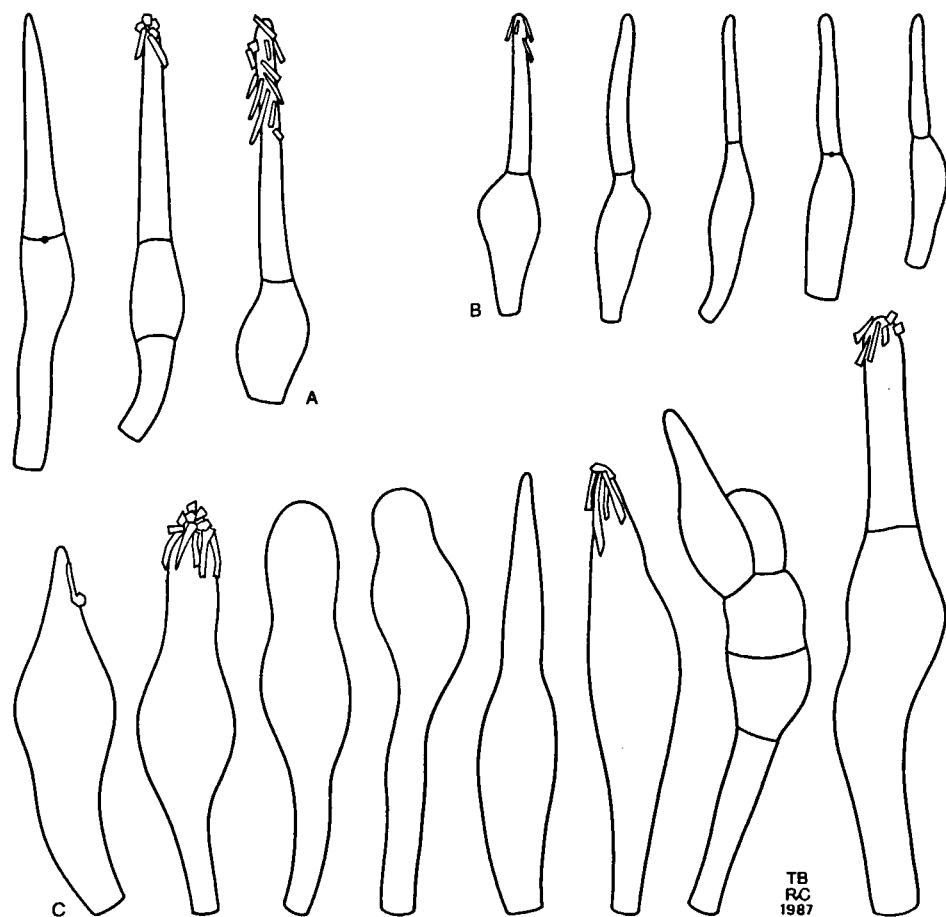


Fig. 1. Types of cystidia in *Melanoleuca*. — A. *Excissa*-type (from *M. excissa*). — B. *Brevipes*-type (from *M. brevipes*). — C. Lageniform to fusiform type (from *M. cinereifolia*). (All figs. $\times 1000$).

DESCRIPTION OF THE GENUS MELANOLEUCA PAT.

(nom. prop. cons. against *Psammospora* Fayod (1893: 91), Taxon 35: 377–378. 1985)

Basidiocarps tricholomatoid, small, medium-sized or large. Pileus convex or applanate, frequently with low umbo and involute margin, mostly somewhat or distinctly hygrophanous, whitish, yellowish, grey-brown, yellow-brown or blackish brown. Lamellae mostly very crowded to crowded, adnexed, sinuate, adnate or even subdecurrent, ventricose to c. triangular-ventricose, whitish, cream, grey, pale brown, yellowish, with concolorous and entire edge. Stipe central, slender or obese, short or long cylindrical, frequently with a clavate base, stuffed or solid, white, yellowish, grey, brown or blackish

brown, frequently longitudinally striate or fibrillose, smooth, with apex mostly pruinose or flocculose. Context whitish to beige-brown, sometimes turning yellow-brown to blackish brown in part of stipe. Smell and taste fungoid, sometimes sweetish or somewhat adstringent. Spore print white or pale yellow.

Spores ellipsoid, covered with amyloid warts, usually with suprahilar plage. Cystidia on lamellae absent or present, often with crystals of apex. Caulocystidia, if present, more or less similar to cystidia on lamellae. Clamps absent.

Cystidia occurring in two main types: (i) Urticiform cystidia ('en poil d'ortie' in French literature), only found at the edge of lamellae, thin-walled, with ventricose base and narrow cylindrical or attenuate neck, to be subdivided into two subtypes: the *excis-sa*-type (Fig. 1A), with rather wide upper part attenuating towards apex and the *brevipes*-type (Fig. 1B), with narrow cylindrical upper part. (ii) Lageniform, fusiform to conical cystidia (Fig. 1C), found both at edge and sides of lamellae, usually somewhat thick-walled with ventricose to fusiform body without distinct upper part.

Type species: *Melaleuca vulgaris* Pat. \equiv *Melanoleuca melaleuca* (Pers.: Fr.) Murrill.

INFRAGENERIC CLASSIFICATION

Singer (1943, 1975, 1986) distinguished four sections in the genus, viz. (i) sect. *Alboflavidae* Sing. containing the white species, (ii) sect. *Humiles* Sing. comprising the pigmented species with a furfuraceous-pubescent or a squamulose stipe, (iii) sect. *Melanoleuca* Sing. with the large pigmented species with a pruinose stipe and (iv) sect. *Oreinae* Sing. with similar species as the preceding section but with small basidiocarps.

Kühner (1978) proposed a division in three sections, viz. (i) sect. *Alboflavidae* Sing., (ii) sect. *Cognatae* Kühner, containing species with more or less ochraceous basidiocarps and sect. *Melanoleuca* Sing. emend. Kühner, characterized by a blackish, brown or yellow-brown pileus, greyish or white lamellae and a white or brown stipe. The latter section has three stirps: stirps *Melanoleuca*, without cystidia, stirps *Grammopodia* with urticiform cystidia and stirps *Polioleuca* with lageniform or fusiform cystidia.

Bon (1978) presented an infrageneric classification based on both macroscopical and microscopical characters. He divided the genus in seven sections. Sect. *Oreinae* and sect. *Melanoleuca* of Singer are united in (i) sect. *Melanoleuca* Sing. emend. Bon (non emend. Kühner) and (ii) sect. *Humiles* of Singer is restricted to species with urticiform cystidia and slender basidiocarps. Besides sect. (iii) *Alboflavidae* Sing. and (iv) sect. *Cognatae* (Sing.) Kühn., Bon distinguished the following new sections: (v) sect. *Acystidiae* Bon, comprising the acystidiate species, (vi) sect. *Grammopodiae* Bon containing species with urticiform cystidia and non-squamulose stipes and (vii) sect. *Strictipedes* Bon characterized by lageniform cystidia and a grey-brown colour of the pileus.

I do not believe that the classifications of Singer and Kühner are consistent from an evolutionary point of view. In their opinion section *Melanoleuca* contains non-cystidiate species as well as species with urticiform and lageniform-fusiform cystidia. It seems improbable that colour and size of basidiocarps are more important characters than features and behaviour of the very typical cystidia. Therefore I propose the following subdivision of the genus *Melanoleuca* in three subgenera (Table I).

Table I. Comparison of infrageneric classifications of the genus *Melanoleuca*.

Singer (1962, 1986)	Kühner (1978)	Bon (1978)	Boekhout
sect. <i>Alboflavidae</i>	sect. <i>Alboflavidae</i>	sect. <i>Alboflavidae</i>	subgen. <i>Macrocystis</i> sect. <i>Alboflavidae</i>
	sect. <i>Cognatae</i>	sect. <i>Cognatae</i>	subgen. <i>Macrocystis</i> sect. <i>Cognatae</i>
sect. <i>Oreinae</i>			
	sect. <i>Melanoleuca</i> stirps <i>Polioleuca</i>	sect. <i>Strictipedes</i> sect. <i>Melanoleuca</i>	subgen. <i>Macrocystis</i> sect. <i>Strictipedes</i>
	sect. <i>Melanoleuca</i> stirps <i>Melanoleuca</i>	sect. <i>Acystidiae</i>	subgen. <i>Melanoleuca</i>
sect. <i>Melanoleuca</i>			
sect. <i>Humiles</i>	sect. <i>Melanoleuca</i> stirps <i>Grammopodia</i>	sect. <i>Grammopodiae</i> sect. <i>Humiles</i>	subgen. <i>Urticocystis</i> sect. <i>Grammopodiae</i> subgen. <i>Urticocystis</i> sect. <i>Humiles</i>

1. MELANOLEUCA SUBGEN. MELANOLEUCA

Melanoleuca sect. *Melanoleuca* stirps *Melaleuca* Kühner in Bull. mens. Soc. linn. Lyon 47: 12. 1978. — *Melanoleuca* sect. *Acystidiae* Bon in Doc. mycol. 33: 45. 1978.

Characterized by the absence of cystidia.

Types species: *M. melaleuca* (Pers.: Fr.) Murrill sensu Kühner ≡ *Melaleuca vulgaris* Pat. = *M. graminicola* Velen.

2. MELANOLEUCA SUBGEN. URTICOCYSTIS BOEKHOUT, subgen. nov.

Melanoleuca sect. *Melanoleuca* stirps *Grammopodia* Kühner in Bull. mens. Soc. linn. Lyon 47: 12. 1978.

Subgenus *Melanoleuca* cystidiis urticiformibus.

Characterized by the presence of urticiform cystidia.

Type species: *M. grammopodia* (Bull.: Fr.) Pat.

Two sections of Bon's classification (1978) belong here, viz. sect. *Humiles* Sing. and sect. *Grammopodiae* Bon. The latter can be divided in two subsections:

Melanoleuca subsect. **Grammopodiae** Boekhout, *subsect. nov.*

Melanoleuca sect. *Grammopodiae* stirps *Brevipes* Bon. in Doc. mycol. 33: 52. 1978. — *Melanoleuca* sect. *Grammopodiae* stirps *Rasilis* Bon in Doc. mycol. 33: 54. 1978. — *Melanoleuca* sect. *Grammopodiae* stirps *Grammopodia* Bon in Doc. mycol. 33: 57. 1978.

Subsectio *Melanoleuca* cystidiis urticiformibus typi *brevipedis*.

Characterized by urticiform cystidia of the *brevipes*-type.

Type species: *M. grammopodia* (Bull.: Fr.) Pat. Other species which belong here are among others *M. brevipes* and *M. rasilis*.

Melanoleuca subsect. **Exscissae** Boekhout, *subsect. nov.*

Melanoleuca sect. *Grammopodiae* stirps *Exscissa* Bon in Doc. mycol. 33: 56. 1978.

Subsectio *Melanoleuca* cystidiis urticiformibus typi *exscissae*.

Characterized by urticiform cystidia of the *exscissa*-type.

Type species: *M. exscissa* (Fr.) Sing. Another species which belong here is *M. politoinaequalipes*.

3. MELANOLEUCA SUBGEN. MACROCYSTIS BOEKHOUT, *subgen. nov.*

Melanoleuca sect. *Melanoleuca* stirps *Polioleuca* Kühner in Bull. mens. Soc. linn. Lyon 47: 12. 1978.

Subgenus *Melanoleuca* macrocystidiis fusiformibus vel lanceolatus vel lageniformibus.

Characterized by the presence of fusiform to lageniform cystidia.

Type species: *M. polioleuca* (Fr.) Kühn.

Three sections in the classification of Bon (1978) are accepted here in this subgenus, viz. sect. *Alboflavidae* Sing., sect. *Cognatae* (Sing.) Kühn. and sect. *Strictipedes* Bon.

I include sect. *Melanoleuca* sensu Sing. (1986: 301) and Bon (1978: 45) in sect. *Strictipedes* Bon, because I noted a great variability of the morphology of the cystidia in this group. *Melanoleuca cinereifolia* is claimed to have lageniform cystidia (Bon, l.c.). Frequently, however, also fusiform to lanceolate cystidia are observed in that species. On the contrary, *M. polioleuca* which is claimed to have fusiform to lanceolate cystidia sometimes also has lageniform cystidia. Because of this variability I do not accept Bon's (l.c.) separation of sect. *Strictipedes* Bon and *Melanoleuca* Sing. emend. Bon. However, as different types of cystidia do occur in sect. *Strictipedes*, I think that a subdivision in subsections probably can be based on these types of cystidia.

DESCRIPTIONS OF SPECIES

Subgen. *Melanoleuca**Melanoleuca melaleuca* (Pers.: Fr.) Murrill

Agaricus melaleucus Pers., Syn. meth. Fung.: 355. 1801. — *Agaricus melaleucus* Pers.: Fr., Syst. mycol. 1: 114. 1821. — *Tricholoma melaleucum* (Pers.: Fr.) Kumm., Führ. Pilzk.: 133. 1871. — *Gyrophila melaleuca* (Pers.: Fr.) Quél., Fl. mycol. France: 267. 1888. — *Melanoleuca melaleuca* (Pers.: Fr.) Murrill in Mycologia 3: 167. 1911. — *Melaleuca vulgaris* Pat. (change of name for *Agaricus melaleucus* Pers.), Hyménomyc. Eur.: 96. 1887. — *Melanoleuca vulgaris* (Pat.) Pat., Catal. rais. pl. cellul. Tunisie: 22. 1897.

Misapplied name. — *Melanoleuca graminicola* (Velen.) Kühner sensu Kühn. & Romagn., Fl. anal. Champ. sup.: 147. 1974.

Selected illustrations. — Fries, Ic. sel. Hymenomyc.: pl. 44. 1867.

Selected descriptions. — Bon in Doc. mycol. 33: 49. 1978; Honrubia, Moreno & Bon in Collect. bot. 13: 551. 1982; Kühner in Bull. mens. Soc. linn. Lyon 47: 13. 1978.

Basidiocarps medium-sized. Solitary. Pileus 35–65 mm, applanate with low broad umbo, finally with centre becoming somewhat depressed, at first with involute margin, slightly exceeding lamellae, rather thin-fleshed, hygrophanous, when moist rather dark yellowish to reddish brown (Expo. 64 DE, Mu. 10 YR 6/6), becoming paler on drying, dull, smooth, occasionally with striate margin. Lamellae crowded ($L = 45-65$, $l = 3-7$), adnate to subdecurrent, thin, up to c. 5.0 mm broad, whitish, sometimes with a pale pink tinge, with entire and concolorous edge. Stipe 55–90 \times 5–8 mm, cylindrical, becoming slightly broader towards base, sometimes becoming also broader towards apex, stuffed, at first whitish, soon becoming pale beige to brown-grey, longitudinally fibrillose, with pruinose apex. Context whitish. Smell indistinct. Taste indistinct, mild to fungoid.

Spores (5.6–)6.4–8.3 \times 4.1–5.8 μm , $Q = 1.15-1.65$, ellipsoid to broadly ellipsoid, moderately densely ornamented with rather large amyloid warts, with plage. Basidia 25–40 \times 7–10 μm , clavate, 4-spored. Cystidia absent. Pileipellis a cutis, made up of 3–5 μm wide hyphae with brown pigment. Stipitipellis at apex of stipe covered with lumps of clavate cells, 25–35 \times 6–9 μm in size, and basidia.

Habitat & distribution. — Terrestrial in coniferous forests (e.g. *Pinus* and *Juniperus*). Very rare in the Netherlands, only known from the provinces Drenthe and Noord-Brabant.

Collections examined. — NETHERLANDS: prov. Drenthe: Dwingeloo, 30 Nov. 1976, Th. W. Kuyper 524 (WAG-W); Nieuw Balinge, state forest 'Gees', 17 April 1977, K. Booy s.n.; prov. Noord-Brabant, Dorst, 18 Oct. 1974, P. B. Jansen 74–291 (both L). — WEST GERMANY: Niedersachsen, Wilsede, B. de Vries 1942, 12 Oct. 1974; ditto 14 Oct. 1974, B. de Vries 1941; Nordrhein-Westfalen, Alstätte, 9 Nov. 1972, B. de Vries 1313, ditto, 24 Oct. 1974, J. J. Barkman 9793 (all WAG-W).

Melanoleuca melaleuca is interpreted here in the sense of Kühner (1978: 13). We agree with Kühner's opinion that *Agaricus melaleucus* Pers.: Fr. represents most probably a non-cystidiate species, because of the described smooth stipe (Persoon 1801: 216 'stipe elongati basi incrassato glabro livido'; Fries 1867, pl. 44 'stipes nudus (non pulverulentes)'), contrary to the descriptions of the stipes of *A. humiles*, *A. polioleucus* and *A. turritus* (Fries 1874: 74 and 75). No authentic material of *A. melaleucus* exists in the herbarium Persoon (L).

It must be noted that both the specimens studied by Kühner (l.c.) and us have a somewhat pruinose apex of the stipe (cit. Kühner 'non poudré, à peine finement pruneux sous la loupe tout en haut seulement') caused by the presence of clavate cells. Cystidia are, however, absent. The specimen we studied agree well with Kühner's description. Related species are *M. stridula* (Fr.) Métrod, *M. striimarginata* Métrod (nom. nud.) and *M. graminicola* (Velen.) Kühner & Maire.

Melanoleuca stridula (Fr.) Métrod (1949: 154) differs by a dark pileus ('bistre foncé') and the presence of subcylindrical cystidia-like cells at the apex of the stipe. *Melanoleuca stridula* (Fr.) Métrod sensu Bresinsky & Stangl (1977: 147) differs by its yellowish lamellae.

Melanoleuca graminicola (Velen.) Kühner & Maire differs mainly from our specimen by small basidiocarps (20–30 mm according to Velenovsky 1920: 244). The spores of a specimen of *M. graminicola* in the Velenovsky collection measure $(7.6-8.0-8.6(-8.8) \times (4.8-5.0-5.7 \mu\text{m})$, $Q = 1.5-1.8$ and are covered by small amyloid warts (Kuyper, unpubl. observations).

Melanoleuca striimarginata Métrod (1942a: 94, nom. nud.) has a striate margin of the pileus and a glabrous stipe. *Barkman* 9793 (WAG-W) has a striate margin of the pileus and thus agrees in that aspect with *M. striimarginata*. The lamellae of that specimen are, however, pale beige (K. & W. B61) to pale ochraceous yellow-brown (K. & W. C61–C72). This latter character fits *M. stridula* (Fr.) Métrod.

Subgen. *Urticocystis* sect. *Grammopodiae* subsect. *Grammopodiae*

Melanoleuca brevipes (Bull.: Fr.) Pat.

Agaricus brevipes Bull., Herb. France, pl. 521, fig. 2. 1791. — *Agaricus brevipes* Bull.: Fr., Syst. mycol. 1: 53. 1821. — *Tricholoma brevipes* (Bull.: Fr.) Kumm., Führ. Pilzk.: 133. 1871. — *Gyrophila brevipes* (Bull.: Fr.) Quél., Enchir. Fung.: 18. 1886. — *Gyrophila grammopodia* var. *brevipes* (Bull.: Fr.) Quél., Fl. mycol. France: 267. 1888. — *Melanoleuca brevipes* (Bull.: Fr.) Pat., Essai taxon.: 159. 1900. — *Tricholoma melaleucum* var. *grammopodium* subvar. *brevipes* (Bull.: Fr.) Maire, Etude synth. Genre *Tricholoma*: 30. 1916.

Selected illustrations. — Dähncke & Dähncke, 700 Pilze: 203. 1979; Konrad & Maublanc, Ic. sel. Fung. 3: pl. 270. 1927.

Selected descriptions. — Bon in Doc. mycol. 33: 52. 1978; Bon & Chevassut in Doc. mycol. 9: 44. 1973; Bresinsky & Stangl in Z. Pilzk. 43: 150. 1977; Kühner in Bull. mens. Soc. linn. Lyon 47: 21. 1978.

Basidiocarps medium-sized, solitary or connate. Pileus (25–)40–90 mm, convex to plano-convex, finally becoming irregular convex with depressed centre, with low broad umbo, with involute margin when young, rather fleshy, weakly hygrophanous, pale to dark grey-brown (Mu. 10 YR 3/2–3, 5–6/4) when moist, pallescent on drying, when moist satiny-shiny, but soon becoming dull and innately radiating fibrillose or minutely felted (under lens!). Lamellae crowded ($L = 55-80$, $l = 1-7$), adnate, emarginate, sinuate or even subdecurrent, thin, up to 6(–11) mm broad, triangular-ventricose or ventricose, when young pale grey-cream (Mu. 2.5 Y 7/2–4), but soon becoming rather dark greyish brown (Mu. 10 YR 7/3), with an entire concolorous edge. Stipe 25–60 \times 5–18 mm, short cylindrical, obese, solid, at first pale brownish grey, but soon becoming

grey-brown (Mu. 10 YR 4/2–4, 3/3), occasionally at apex with faint bluish tinge, entirely longitudinal fibrillose and apex subflocculose. Context in pileus sordid white or pale yellowish brown, in stipe isabella-brown, towards base of stipe dark brown. Smell weak, fungoid or sweet, fruity. Taste fungoid or acrid-herbaceous. Spore print yellowish white (Romagnesi, *Les Russules*, 1b–2a).

Spores $(6.9-7.4-9.7 \times 4.2-5.8 \mu\text{m})$, $Q = 1.3-1.8(-2.0)$, ellipsoid to elongate, mostly with largest width above the middle, rather densely ornamented with fine to rather coarse amyloid warts, with suprahilar plage. Basidia $30-40 \times 7-10 \mu\text{m}$, clavate, $(2-3-4)$ -spored. Cheilocystidia $25-50 \times 5-10 \mu\text{m}$, urticiform and of the *brevipes*-type, frequently with resinaceous contents in upper part. Pileipellis an (ixo-)trichodermium, up to c. $70 \mu\text{m}$ thick, made up of slender, $2-6 \mu\text{m}$ wide hyphae. Cells of upper part of the pileitrama with pale brown intracellular pigment and cell walls also partly encrusted by yellowish brown pigment. Stipitipellis a cutis, sometimes somewhat gelatinized, at apex of stipe with lumps of clavate cells, $30-50 \times 6-9 \mu\text{m}$ in size, among them some urticiform caulocystidia.

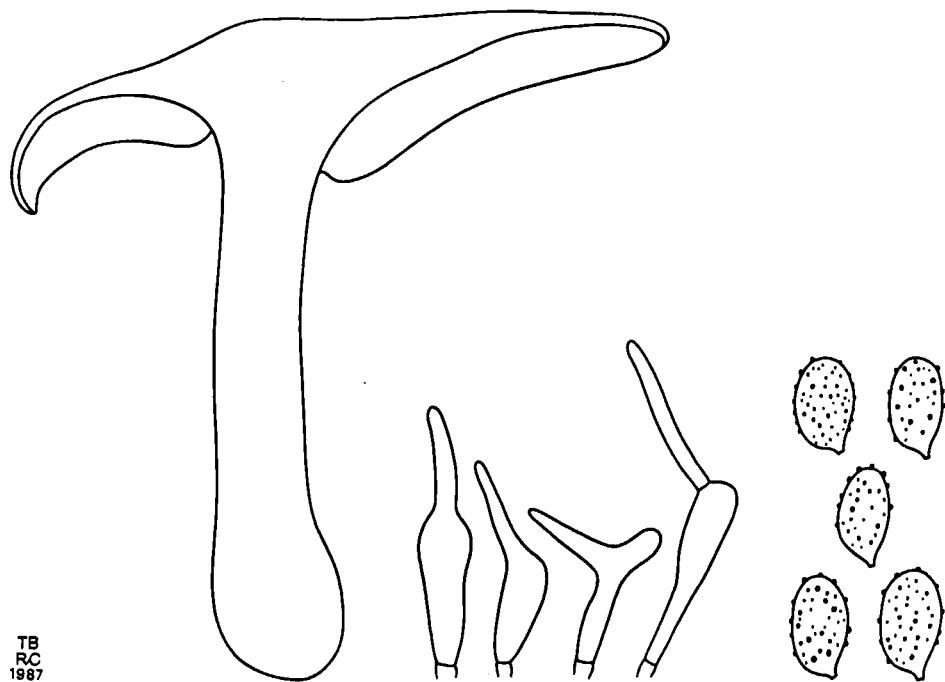
Habitat & distribution. — Terrestrial on humus rich soils, in both broad-leaved and coniferous forests, in grasslands (lawns) and on compost; basidiocarps occurring mainly in spring, but occasionally also in autumn; rather common, seems to occur in all parts of the Netherlands.

Collections examined. — NETHERLANDS: prov. Friesland, Ameland, near Hollum, 27 Oct. 1973, *C. Bas* 6240; prov. Flevoland, Oostelijk Flevoland, de Abbert, 20 March 1977, *H. J. W. Langevoort-Dul s.n.*; prov. Gelderland, Apeldoorn, Berg en Bos, 4 May 1958, *A. N. Koopmans* 141; prov. Utrecht, Baarn, garden of phytopathological laboratory Willie Commelin Scholten, 3 Dec. 1981, *H. A. van der Aa s.n.*; prov. Zuid-Holland: Leiden, near Academic Hospital, 23 March 1977, *F. Bas-Moes s.n.*; ditto, Telderskade, 6 April 1983, *C. Bas* 8095; Katwijk, Pan van Persijn, 12 Oct. 1957, *R. A. Maas Geesteranus* 12388; Voorschoten, estate 'Ter Horst', 14 April 1972, *C. Bas* 5993; Wassenaar, 'Kijfhoek', 30 Oct. 1952, *R. A. Maas Geesteranus* 9250 (all L); prov. Zeeland, Veere, 29 Oct. 1976, *P. B. Jansen s.n.*; prov. Noord-Brabant, Dorst, 8 Sept. 1975, *P. B. Jansen s.n.* (herb. Jansen); prov. Limburg, Wijre, 28 Oct. 1979, *C. Bas* 7611 (L). — FRANCE: *Métrod* 1343; 1886; 2798 and notes of *Métrod* 1343; 1343.2; 1886; 2029; 2172; 2426; 2798; *Métrod s.n.*, 27 Aug. 1951; *Métrod s.n.*, 7 Aug. 1960 (all PC).

Melanoleuca brevipes differs from *M. grammopodia* by the medium-sized basidiocarps, the less pronounced longitudinal fibrillosity of the stipe and the brown context of the stipe. *Melanoleuca rasilis* differs by shorter spores covered by coarse warts. Most of the specimens studied have a short stipe, although in some collections some basidiocarps were present with a stipe as long as the diameter of the pileus. *Melanoleuca brevipes* sensu J. Lange (1935: 65) (sub *Tricholoma brevipes*) is a different species because of its fusiform to lageniform cystidia.

Melanoleuca grammopodia (Bull.: Fr.) Pat.

Agaricus grammopodius Bull., Herb. France: pl. 548. 1791. — *Agaricus grammopodius* Bull.: Fr., Syst. mycol. 1: 93. 1821. — *Tricholoma grammopodius* (Bull.: Fr.) Quél. in Mém. Soc. Emul. Montbéliard, sér. II, 5: 83. 1872. — *Gyrophila grammopodia* (Bull.: Fr.) Quél., Enchir. Fung.: 17. 1886. — *Melanoleuca grammopodia* (Bull.: Fr.) Pat., Essai taxon.: 159. 1900. — *Tricholoma melanoleucum* var. *grammopodium* (Bull.: Fr.) Maire, Étude synth. genre *Tricholoma*: 28. 1916.



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Fig. 2. *Melanoleuca grammopodia*. — Habit ($\times 1$). — Cheilocystidia ($\times 1000$). — Spores ($\times 1500$).

forma *grammopodia* — Fig. 2

Selected illustrations. — Cetto, *Funghi Vero* 1: pl. 146. 1975; Konr. & M., *lc. sel. Fung.* 3 pl. 269. 1927; Lange, *Fl. agar. dan.* 1: pl. 29C. 1935; Michael, Hennig, Kreisel, *Handb. Pilzfr.* 3: pl. 202. 1979; Phillips, *Mushr. other Fungi*: 45. 1981.

Selected descriptions. — Bresinsky & Stangl in *Z. Pilzk.* 43: 152. 1977.

Basidiocarps medium-sized to large, solitary. Pileus 60–105 mm, plano-convex, mostly with depressed centre, with low broad umbo, with involute margin, thick-fleshed, greyish brown to dark grey-beige (Mu. 10 YR 4–6/3), becoming paler on drying; somewhat paler towards margin, dull, sometimes with centre somewhat shiny, innately radially fibrillose, with outermost margin somewhat pruinose. Lamellae crowded ($L = c. 70$, $l = 1-5$), sinuate, rather thick, up to 9.0 mm broad, triangular-ventricose, pale cream-beige (Mu. 10 YR 7/3–4), with entire concolorous edge. Stipe 60–105 \times 8–13 mm, cylindrical with clavate base, solid, pale beige to beige-brown (Mu. 10 YR 5/4, 7/3), distinctly longitudinal striate, with pruinose apex. Context greyish white (Mu. 10 YR 8/2), in stipe loosely fibrillose. Smell weak, just after cutting somewhat spermiatic. Taste unpleasant, acrid-fungoid. Spore print pale cream (Romagnesi, *Les Russules*, 1b–2a).

Spores 8.0–9.8 \times 4.2–6.0 μm , $Q = 1.5$, ellipsoid to elongate, rather densely ornamented with small to medium-sized, amyloid warts, with suprahilar plaque. Basidia 30–

40 × 8–13 µm, clavate, 4-spored. Cheilocystidia 30–40 × 5–9 µm, urticiform and of *brevipes*-type, mostly transversely septate. Pileipellis a thin, somewhat gelatinized cutis made up of slender hyphae. Stipitipellis a cutis, at apex of stipe basidia present.

Habitat & distribution. — Terrestrial in broad-leaved forests and bushes; rather rare, in the Netherlands known from the coastal dunes and from calcareous rich soils in the provinces of Limburg and Flevoland.

Collections examined. — NETHERLANDS: prov. Flevoland, Oostelijk Flevoland, 'Spijkbos', 11 Sept. 1980, *Th. W. Kuyper* 1429; prov. Zuid-Holland, Wassenaar 'Meyendel', 6 Oct. 1951, *R. A. Maas Geesteranus* 8058; ditto, 7 Nov. 1951, *C. Bas* s.n.; ditto, 'Duinrell', 25 Sept. 1981, *C. Bas* 7788; Westvoorne, 'Quakjeswater', 19 Oct. 1982, *T. Boekhout* 1044; prov. Limburg, St. Pieter, 'Sint Pietersberg', 18 Oct. 1950, *R. A. Maas Geesteranus* 7543 (all L). — FRANCE: (notes on) *Métrod* 39; 39.2; 1495; 1739 (all PC).

Melanoleuca grammopodia is closely related to *M. brevipes*. It differs from the latter species by a relatively long, coarsely, longitudinally striate stipe with a pale grey context and less grey lamellae.

Melanoleuca grammopodia as described by Kühner (1978: 26) differs from the specimen studied by me by a more yellow ochraceous pileus (Mu. 2.5 Y 8/6–7).

Melanoleuca subbrevipes Métrod (1942a: 90, nom. nud.) is closely related to *M. grammopodia*. The only differences mentioned by Métrod in his notes of his collection 560 (PC) are the pale and large pileus and shorter cystidia of *M. subbrevipes*.

In Table II we summarize the colour of the pileus of collections seen by Métrod of both *M. subbrevipes* and *M. grammopodia*.

Métrod mentioned a diameter of up to 20 cm for *M. grammopodia* (in his notes on *Métrod* 39, PC) and his drawings of the cystidia of both *M. grammopodia* and *M. subbrevipes* do not indicate a difference between these taxa. Therefore we agree with Kühner (1978: 26), who reduced *M. subbrevipes* to forma under *M. grammopodia*.

The name *M. subbrevipes* Métrod, however, was not published in full accordance with the International Code of Botanical Nomenclature (Voss & al. 1983) and therefore Kühner's new combination was not validly published either. As, moreover, the original collection (*Métrod* 50, PC) of *M. subbrevipes* is very poor, I prefer to describe a new forma with a better type collection for this large variant of *M. grammopodia*.

Table II. Colour of the pileus of collections of *M. subbrevipes* and *M. grammopodia* seen by Métrod (all in PC).

species	collection	colour of pileus
<i>M. subbrevipes</i>	Métrod 560	- gris beige, brunâtre au centre
	Métrod s.n.	- ocracé grisâtre, brun au centre
<i>M. grammopodia</i>	Métrod 39	- brun bistre très plus foncé au centre
	Métrod 1739	- bistre très foncé; la couleur pâlis à l'ocracé brunâtre

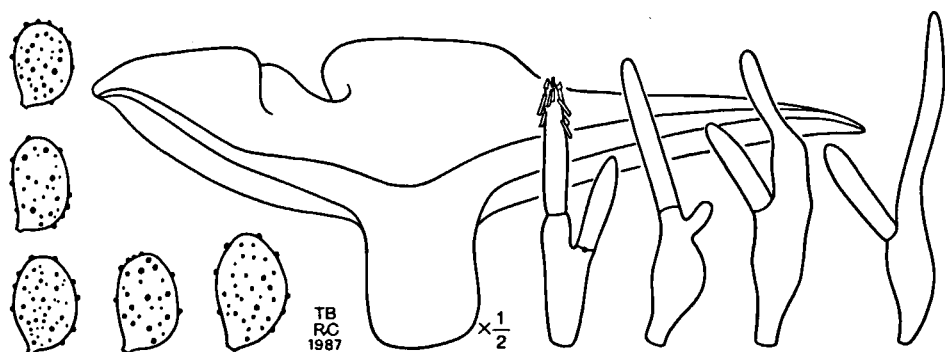


Fig. 3. *Melanoleuca grammopodia* f. *macrocarpa*. — Habit ($\times \frac{1}{2}$). — Spores ($\times 1500$). — Cheilocystidia ($\times 1000$).

***Melanoleuca grammopodia* forma *macrocarpa* Boekhout, f. nov. — Fig. 3**

Melanoleuca subbrevipes Métrod (nom. nud.) in Rev. Mycol. 7: 90. 1942. — *Melanoleuca grammopodia* var. *subbrevipes* (Métrod) Kühn. & Romagn., Fl. anal. Champ. sup.: 147. 1953. — *Melanoleuca grammopodia* f. *subbrevipes* (Métrod) Kühn. in Bull. mens. Soc. linn. Lyon 47: 26. 1978.

Selected illustration. — Cetto, Funghi Vero 2: pl. 595. 1975.

Selected description. — Bon in Docum. mycol. 33: 52. 1978.

Differt a forma *grammopodia* basidiocarpis magnis et fere brevistipitatis. Pileus ad 30 cm diam., in medio ochraceo-griseus. Stipes dilute griseus fibris longitudinalibus fuscis praeditus. Lamellae ochraceo-griseae. Contextus albidus, in stipite brunneus.

Holotypus: *Erkelens s.n.*, 2 Nov. 1977, Netherlands, prov. Utrecht, Leusden (L).

Basidiocarps large, solitary. Pileus up to 200(–300) mm, finally slightly infundibuliform, with lobed margin, pale grey-brown (Expo. 33D), dry. Lamellae moderately crowded, subdecurrent, up to c. 8.0 mm wide, pale clay-coloured (Expo. 82–83B), with pinkish reflex. Stipe 30–100 \times 10–35 mm, cylindrical, solid, dark brown (Expo. 72 F–H), longitudinally fibrillose and ribbed. Context isabella, becoming brown in base of stipe. Smell somewhat acrid, sourish herbaceous. Taste unpleasant, bitterish herbaceous. Spore print unknown.

Spores 7.7–9.8 \times 4.8–6.2 μ m, $Q = 1.4$ –1.85, ellipsoid to elongate, moderately densely ornamented with small to medium-sized amyloid warts, with suprahilar plage. Basidia 25–35 \times 9–13 μ m, clavate, 4-spored. Cheilocystidia 30–55 \times 6–8 μ m, urticiform, with 2–4 μ m wide upper cell, with apex encrusted by crystals. Pileipellis made up of slender ascending hyphae, upper part of pileitrama compact, with intracellular brown pigment. Stipitipellis at apex of stipe with clavate cells and urticiform cystidia.

Habitat & distribution. — Terrestrial in broad-leaved forests (*Acer* and *Populus*) and in mixed forests, also in dry meadows. In the Netherlands very rare.

Collections examined. — NETHERLANDS: prov. Utrecht, Leusden, 2 Nov. 1977, *Erkelens s.n.* (holotype, L). — FRANCE: Métrod 560, 26 Sept. 1935 (PC, containing only scanty fragments).

The specimen from the Netherlands agrees well with Métrod's *M. subbrevipes* Métrod (nom. nud.), because of similar large basidiocarps with a brown context of the stipe and similar spores and cheilocystidia. Métrod supposed a relationship to both *M. grammopodia* and *M. brevipes* (in notes Métrod 560, PC). Because of the size of the basidiocarps and the longitudinally ribbed stipe we agree with Kühner (1978: 26), who regards this form as an infraspecific taxon of *M. grammopodia*.

Melanoleuca rasilis (Fr.) Sing.

Agaricus rasilis Fr., Epicr.: 54. 1836–1838. — *Gyrophila rasilis* (Fr.) Quél., Fl. mycol. Fr.: 269. 1888. — *Tricholoma rasile* (Fr.) Sacc., Syll. Fung. 5: 140. 1887. — *Melanoleuca rasilis* (Fr.) Sing. in Schweiz. Z. Pilzk. 17: 56. 1930.

Melanoleuca rasilis var. *leucophylloides* Bon in Docum. mycol. 9: 46. 1973. — *Melanoleuca leucophylloides* (Bon) Bon in Docum. mycol. 41: 40. 1980.

Melanoleuca pseudoluscina Bon in Docum. mycol. 37: 89. 1980.

Excluded. — *Melanoleuca rasilis* sensu Métrod in Bull. trimest. Soc. mycol. Fr. 64: 156. 1948 (= *M. brevipes*).

var. *rasilis* — Fig. 4A

Selected illustration. — Bres. in Iconogr. mycol. 3: pl. 130. 1928.

Selected description. — Bon in Docum. mycol. 33: 54. 1978.

Basidiocarps small to medium-sized, solitary or subgregarious. Pileus 20–60(–75) mm, convex to plano-convex, finally with centre becoming depressed, with low broad umbo, with margin slightly exceeding lamellae, moderately thick-fleshed, hygrophanous, when moist dark brown (Mu. 10 YR 3/4, 7.5 YR 3/2), slightly paler towards margin, pallescent on drying (Mu. 10 YR 4/3), when moist shiny, subviscid, when dry dull, glabrous, but with outermost margin greyish pruinose. Lamellae rather distant ($L = (30-)$ 40–70, $l = 1-7$), sinuose to emarginate, rather thick, triangular, when young greyish white (Mu. 10 YR 8/2), but soon becoming greyish beige (Mu. 10 YR 6/2–4), with entire, concolorous edge. Stipe (15–)30–60 × 3–6(–8) mm, cylindrical, terete or somewhat flattened, stuffed, greyish beige to dark grey (Mu. 10 YR 3–4/2, 5/4), innately longitudinal striate, glabrous but with minutely pruinose apex. Context of pileus whitish, yellowish or brown (Mu. 10 YR 4/4, 7/6), occasionally with dark line over lamellae, in stipe yellowish brown, turning ochraceous brown in extreme base. Smell weak, reminding of *Lycoperdon perlatum*. Taste weak, somewhat rancid.

Spores 5.8–7.9 × 4.2–6.0 μ m, $Q = 1.2-1.65$, broadly ellipsoid to ellipsoid, rather densely ornamented with large, amyloid warts, with suprahilar plage. Basidia 30–45 × 6–11 μ m, (2–)4-spored. Cheilocystidia 30–50 × 5–9 μ m, urticiform and of *brevipes*-type, usually septate, with apex frequently encrusted by crystals. Pileipellis a slightly gelatinized, 70–90 μ m thick trichodermium, made up of 3–6 μ m wide hyphae, sparsely encrusted with lumps of yellowish pigment, upper part of pileitrama compact and cells with intracellular pale brown pigment. Stipitipellis near apex of stipe with lumps of clavate cells and scattered urticiform caulocystidia.

Habitat & distribution. — Terrestrial in grasslands, also near *Salix repens* and coniferous trees. Rather common in coastal dunes.

Collections examined. — NETHERLANDS: prov. Noord-Holland: Aerdenhout, 'Koningshof', 27 Dec. 1982, *A. G. Becker s.n.*; Bergen, 'Duinvermaak', 13 Nov. 1982, *Th. W. Kuyper 2329*; Castricum, watersupply dunes, 10 Aug. 1952, *R. A. Maas Geesteranus 8910 & H. J. van der Laan*; Santpoort, 'Duin en Kruidberg', 14 Dec. 1982, *A. G. Becker s.n.*; Vogelenzang, watersupply dunes, 25 Nov. 1982, *C. Bas s.n.*; prov. Zuid-Holland: Wassenaar, 12 Dec. 1982, *C. Bas 8088 & E. Arnolds*; Westvoorne, 'Voorne's duin', 18 Oct. 1982, *T. Boekhout 1046* (all L).

Melanoleuca rasilis is related to *M. brevipes*. It differs from that species mainly because of its broadly ellipsoid and coarsely ornamented spores. Other smaller differences are smaller basidiocarps, fruiting in autumn and the length of the stipe equalling the diam-

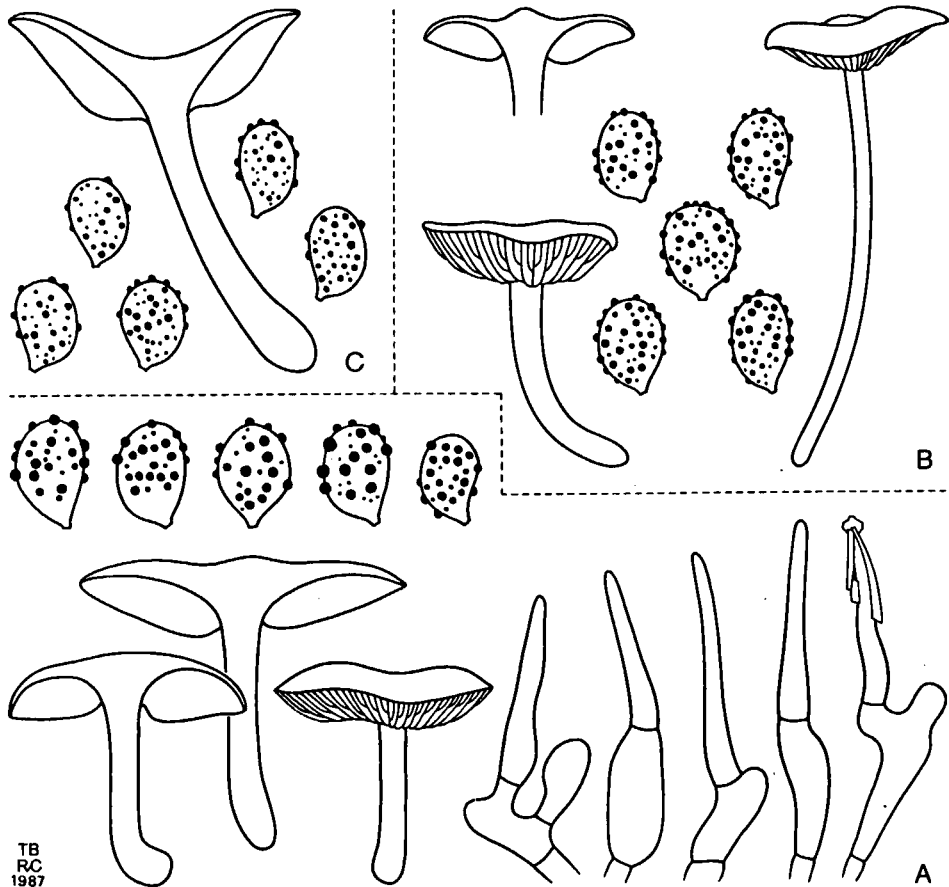


Fig. 4. *Melanoleuca rasilis*. — A. Var. *rasilis*. — Habit ($\times 1$). — Spores ($\times 1500$). — Cheilocystidia ($\times 1000$). — B. Var. *pseudoluscina*. — Habit ($\times 1$). — Spores ($\times 1500$). — C. Var. *leucophylloides*. — Habit ($\times 1$). — Spores ($\times 1500$).

eter of the pileus. Specimens of *M. rasilis* in the herbarium of Métrod belong partly to this species (e.g. *Métrod* 2275, PC) and partly to *M. brevipes* (e.g. *Métrod* 1395 and 2030). The description given by Métrod (1949: 156) seems to represent specimen belonging to *M. brevipes*.

Besides typical *M. rasilis* two varieties can be distinguished:

***Melanoleuca rasilis* var. *pseudoluscina* (Bon) Boekhout, *comb. nov.* — Fig. 4B**

Melanoleuca pseudoluscina Bon in Docum. mycol. 37: 89. 1980 (basonym).

Selected description. — Honrubia, Moreno & Bon in Collect. bot. 13: 551. 1982.

Differs from the type variety by the colour of the lamellae, which are first greyish white (Mu. 10 YR 8/2), but soon become yellowish (Mu. 10 YR 7/6).

Habitat & distribution. — Terrestrial in grasslands in coastal dunes. Very rare in the Netherlands; known only from the isle of Terschelling and from Wassenaar.

Collections examined. — NETHERLANDS: prov. Friesland, isle of Terschelling, Formerum aan Zee, 25 Oct. 1982, *Boekhout* 1055 (L); prov. Zuid-Holland, Wassenaar, Meyendel, 'Kijfhoek', 6 Nov. 1957, *R. A. Maas Geesteranus* 12451 (L).

var. *leucophylloides* Bon. — Fig. 4C

Melanoleuca rasilis var. *leucophylloides* Bon in Docum. mycol. 9: 46. 1973. — *Melanoleuca leucophylloides* (Bon) Bon in Docum. mycol. 41: 40. 1980.

Selected description. — Bon in Docum. mycol. 33: 55. 1978.

Differs from the typical variety by its whitish (Mu. 10 YR 8/1–2, 2.5 Y 8/2) lamellae, which sometimes have a faint yellow or pink reflex.

Habitat & distribution. — Terrestrial, near coniferous trees in coastal dunes, but also in broad-leaved forests on calcareous rich loam. In the Netherlands known from coastal dunes, in Belgium known from the Ardennes.

Collections examined. — NETHERLANDS: prov. Noord-Holland: Bloemendaal, Kennemerduinen, 'Brederodeberg', 1 Dec. 1982, *A. G. Becker s.n.*; Vogelenzang, watersupply dunes, 'Panneland', 24 Oct. 1981, *C. Bas* 7854 and 7855 (all L).

Subgen. *Urticocystis* sect. *Grammopodiae* subsect. *Exscissae*

***Melanoleuca exscissa* (Fr.) Sing.**

Agaricus exscissus Fr., Syst. mycol. 1: 114. 1821. — *Tricholoma exscissa* (Fr.) Quél. in Mém. Soc. Emul. Montbéliard, sér. II, 5: 344. 1872. — *Melanoleuca exscissa* (Fr.) Sing. in Cavanillesia 7: 125. 1935.

Melanoleuca iris Kühner in Bull. mens. Soc. linn. Lyon 25: 178. 1956.

Melanoleuca cinerascens Reid in Coll. Icon. rare interest. Fungi 2: 16. 1967.

Selected illustrations. — Bresadola, Ic. mycol. 3: pl. 131. 1928; Fries, Ic. sel. Hymenomyces, pl. 44. 1871; Lange, Fl. agar. dan. 1: pl. 31c. 1935; Reid, l.c.: pl. 13b. 1967.

Selected descriptions. — Arnolds, Ecol. Coenol. Macrofungi Grassl. Heathl. Drenthe, Netherlands, 3: 400. 1982; Kühner in Bull. mens. Soc. linn. Lyon 25: 177. 1956.

Basidiocarps medium-sized, solitary. Pileus 20–70 mm, plano-convex, with depressed centre, mostly with low umbo, when young with inflexed margin, sometimes with outermost margin slightly exceeding lamellae, rather thin-fleshed, not hygrophanous, whitish, grey or grey-brown (Mu. 10 YR 6/2, 8/3), with centre slightly to distinctly darker (Mu. 10 YR 5/2, 6/3), dull, dry with centre satiny-sericeous, sometimes somewhat arachnoid around umbo, innately radially fibrillose, when young with outermost margin pruinose. Lamellae crowded ($L = 40\text{--}60$, $l = 1\text{--}7$), emarginate, sinuate or subdecurrent, ventricose or triangular-ventricose, 3–6 mm broad, thin, whitish, becoming pale pinkish beige (Mu. 7.5 YR 8/2–3), with entire or somewhat irregular concolorous edge. Stipe 20–60 \times 3–7 mm, cylindrical, attenuate towards base, occasionally with slightly clavate base, solid, whitish, becoming pale isabella (Mu. 10 YR 8/3), slightly longitudinally fibrillose or glabrous, when young with apex flocculose. Context whitish to pale greyish brown. Smell absent or weak, fruity. Taste indistinct, mild or somewhat unpleasant, adstringent. Spore print cream (Romagnesi, *Les Russules*, 2a).

Spores 7.5–10.5 \times 5.0–6.5 μm , $Q = 1.5\text{--}1.9$, ellipsoid to elongate, densely ornamented with small, amyloid warts, with suprahilar plage. Basidia 30–40 \times 10–13 μm , clavate, 4-spored. Cheilocystidia 30–55 \times 5–10 μm , of *excissa*-type, mostly transversely septate and upper cell frequently with resinaceous contents. Pleurocystidia very sparse, similar to cheilocystidia. Pileipellis a sometimes slightly gelatinized 20–50 (–100) μm thick trichodermium, made up of 3–6 μm wide, somewhat ascending hyphae with obtuse or clavate terminal cells, occasionally at apex encrusted with crystals. Upper part of pileitrama with yellowish cell walls.

Habitat & distribution. — Terrestrial in grasslands and in broad-leaved and coniferous forests; rather common, specially in coastal dunes and on rich soils.

Collections examined. — NETHERLANDS: prov. Friesland: isle of Terschelling, West Terschelling, 19 Oct. 1981, *M. E. Noordeloos 1616*; ditto, Hoorn, 'Hoorne Bos', 20 Oct. 1981, *M. E. Noordeloos 1622*; prov. Drenthe, Zuidlaren, 23 Aug. 1967, *Jansonius s.n.*; prov. Overijssel, Ommen, 'Eerder Achterbroek', 14 Oct. 1962, *E. Kits van Waveren s.n.*; prov. Utrecht, Bunnik, 'Fort bij Rhijnauwen', 3 July 1972, *E. Arnolds 664*; prov. Zuid-Holland: Leiden, 'Leidse Hout', 4 June 1981, *Th. W. Kuyper 1574*; Overschie, 10 Nov. 1959, *J. A. Schragezande s.n.*; Rotterdam, 'Groenendaal', 23 Dec. 1965, *N. P. W. Balke s.n.*; prov. Zeeland: Aardenburg, 'Elderschan', 9 Oct. 1980, *A. de Meyer 158*; ditto, 12 April 1981, *A. de Meyer 158b*; prov. Limburg, Bunde, 'Bunderbos', 14 Sept. 1980, *Th. W. Kuyper 1446* (all in L).

Within the specimens studied the colour of the pileus varies from whitish, grey to grey-brown. Therefore I do not agree with Reid (1967: 17) who considers the species pictured by Fries (1871: pl. 44) as different from his *M. cinerascens*. Also the clitocybioid habitus of *M. cinerascens* falls within the observed morphological range of *M. excissa*.

Noordeloos 1622 (L) differs from the other specimens because of the orange-ochre context of its stipe (close to Mu. 7.5 YR 7/8). Probably this specimen represents an infraspecific taxon on its own. However, more material is necessary to come to a final decision. *M. iris* Kühner differs from *M. excissa* only by its peculiar smell. Therefore we reduce this taxon to variety under *M. excissa*.

Melanoleuca excissa var. *iris* (Kühner) Boekhout, *comb. nov.* — Fig. 5

Melanoleuca iris Kühn. in Bull. mens. Soc. linn. Lyon 25: 178. 1956 (basionym).

Selected descriptions. — Arnolds, *Ecol. Coenol. Macrofungi* Grassl. Heathl. Drenthe, Netherlands 3: 400. 1982; Klán in *Česká Mykol.* 37: 52. 1983.

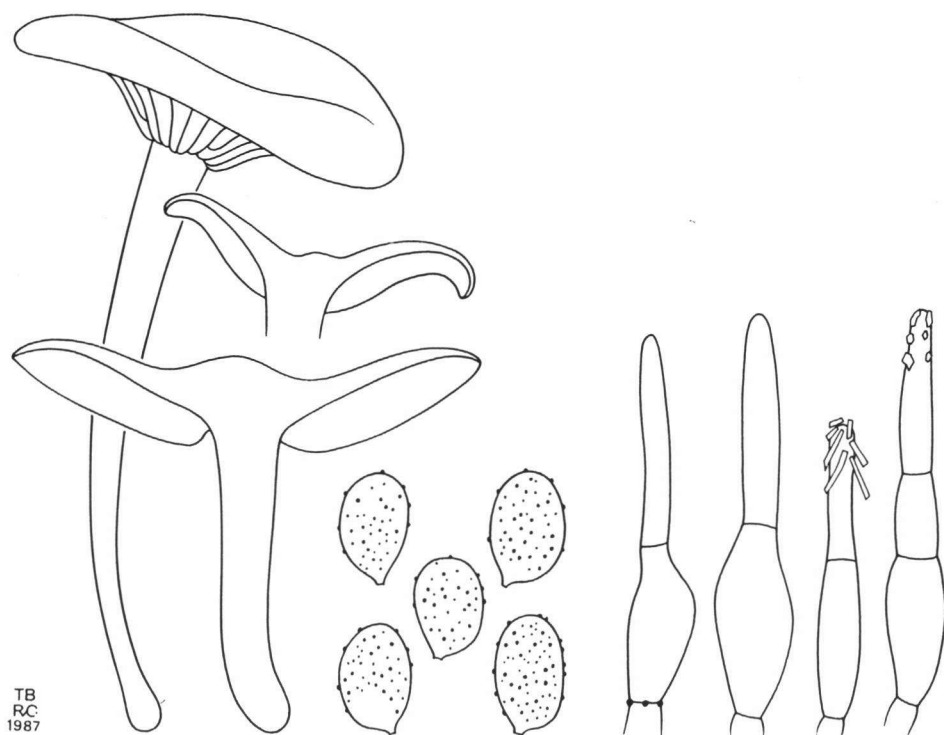


Fig. 5. *Melanoleuca excissa* var. *iris*. — Habit ($\times 1$). — Spores ($\times 1500$). — Cheilocystidia ($\times 1000$).

Differs from the typical variety by a strong, pleasant, sweet smell (reminding the smell of *Lepista irina*).

Habitat & distribution. — Terrestrial in grasslands and in broad-leaved and coniferous forests; rather common, seems to occur in all parts of the Netherlands.

Collections examined. — NETHERLANDS: prov. Friesland: isle of Terschelling, West Terschelling, 'Kroonpolders', 27 Oct. 1982, *Boekhout 1062*; Appelscha, 24 Oct. 1970, *G. Stobbe*; prov. Overijssel: Deventer, estate 'Wijtenhorst', 25 Oct. 1969, *G. & H. Piepenbroek s.n.*; ditto, 2 Nov. 1969, *G. & H. Piepenbroek*; Diepenveen, near estate 'Nieuw Rande', 11 June 1972, *G. & H. Piepenbroek s.n.*; Ommen, 'Mataran', 18 Oct. 1971, *P. Haxe*; Wichmond, 4 Nov. 1982, *T. Boekhout 1080 and 1083*; prov. Gelderland: Gietelo, 'Gietelse Bos', 22 April 1972, *G. & H. Piepenbroek s.n.*; Nunspeet, 27 Sept. 1958, *C. Bas 1560*; Overasselt, 'Hatertse vennen', 21 Oct. 1969, *E. Arnolds 423*; prov. Utrecht: Amersfoort, 'Birkhoven', 7 July 1984, *J. Wisman s.n.*; Bunnik, 4 Nov. 1982, *J. Schreurs s.n.*; Veenendaal, near 'Trekpot', 15 Oct. 1967, *F. Tjallingii s.n.*; prov. Noord-Holland, Vogelenzang, watersupply dunes, 19 Oct. 1969, *E. Arnolds 415*; prov. Zuid-Holland, Leiden, 30 Nov. 1982, *C. Bas s.n.* (all L).

Melanoleuca politoinaequalipes (Beguet) Bon

Melanoleuca grammopodia var. *politoinaequalipes* Beguet in Docum. mycol. 5: 37. 1972. — *Melanoleuca politoinaequalipes* (Beguet) Bon in Docum. mycol. 33: 59. 1978.

Basidiocarps small to medium-sized, solitary. Pileus 20–60 mm, applanate, but soon with depressed centre, frequently with low broad umbo, with margin involute and slightly exceeding the lamellae, rather thin-fleshed, hygrophanous, when moist rather dark olivaceous brown (Mu. 10 YR 3–4/4), becoming pale greyish brown on drying (Mu. 10 YR 5/3), glabrous, smooth, innately radiating fibrillose, near margin somewhat tomentose. Lamellae crowded ($L \cong 110$, $l = 3$), emarginate to subdecurrent, rather thick, triangular or concave, pale yellowish beige (Expo. B72, Mu. 10 YR 8/3); edge entire and concolorous. Stipe 40–60 × 5–13 mm, attenuate towards base, stuffed, pale beige (Mu. 10 YR 7/4), innately longitudinally fibrillose, with pruinose apex. Context whitish to pale isabella, sometimes with pinkish reflex in lower half of stipe after cutting. Smell indistinct but after cutting somewhat rancid. Taste rancid or sourish. Spore print unknown.

Spores $7.0\text{--}9.3 \times 4.1\text{--}5.9 \mu\text{m}$, $Q = 1.5\text{--}1.9$, ellipsoid to elongate, rather densely ornamented with rather coarse amyloid warts. Basidia $30\text{--}40 \times 7\text{--}11 \mu\text{m}$, clavate, (2–) 4-spored. Cheilocystidia $35\text{--}65 \times 5\text{--}8 \mu\text{m}$, urticiform of *excissa*-type, usually septate, upper cell mostly with resinaceous content, at apex frequently encrusted with crystals. Pleurocystidia very sparse, similar to cheilocystidia. Pileipellis a trichodermium, up to $280 \mu\text{m}$ thick, made up of $3\text{--}4 \mu\text{m}$ wide hyphae with obtuse or slightly clavate apex, upper part of pileitrama compact, with pale brown intracellular pigment. Stipitipellis a cutis, covered with lumps of clavate cells. Caulocystidia urticiform, $30\text{--}45 \times 5\text{--}9 \mu\text{m}$.

Habitat & distribution. — Terrestrial in grass-land, but also known from tulip-border of 'Keukenhof' park. In the Netherlands known from only three locations.

Collections examined. — NETHERLANDS: prov. Friesland, isle of Terschelling, West Terschelling, 19 Oct. 1981, *M. E. Noordeloos 1609*; prov. Zuid-Holland: Leiden, 16 Nov. 1982, *M. A. Brand s.n.*; Lisse, 'Keukenhof', 23 April 1961, *C. Bas 2321* (all L).

Melanoleuca politoinaequalipes as described by Beguet (1972: 37) and Bon (1978: 59) differs from our specimen by slightly larger basidiocarps, fungoid smell, and somewhat larger spores ($9\text{--}10.5\text{--}11 \times 5.5\text{--}6\text{--}7\text{--}7.5 \mu\text{m}$), but agrees by a similar grey-brown pileus and similar cheilocystidia of the *excissa*-type. *Melanoleuca politoinaequalipes* differs from *M. excissa* by its hygrophanous, dark olivaceous brown pileus, its attenuating stipe and its pileipellis, which is a well-developed trichodermium. *Melanoleuca excissa* sensu Métrod (1949: 157, pl. 1 fig. 3) also has a dark pileus, but differs clearly by lageniform cystidia.

Subgen. *Macrocyttidia* sect. *Cognatae****Melanoleuca cognata* (Fr.) Konr. & M.**

'Agaric arqué' Bull., Herb. France: pl. 589. 1793; non *Agaricus arcuatus* Bull. in Bull. & Ventenat, 1812; non *Agaricus arcuatus* Bull.: Fr., 1821.

Agaricus arcuatus var. *cognatus* Fr., Epicr.: 46. 1836. — *Tricholoma cognatum* (Fr.) Gill, Hyménomycètes: 124. 1878. — *Tricholoma arcuata* var. *cognatum* (Fr.) Sacc., Syll. Fung. 5: 127. 1887. — *Melanoleuca cognata* (Fr.) Konr. & M., Ic. sel. Fung. 3, pl. 217. 1927.

Excluded. — *Agaricus arcuatus* Bull. in Bull. & Ventenat, Hist. Champ. France 2: 595. 1812. — *Agaricus arcuatus* Bull.: Fr., Syst. mycol. 1: 109. 1821. — *Gyrophila arcuata* (Bull.: Fr.) Quél., Fl. mycol. France: 267. 1888. — *Tricholoma melanoleucum* var. *arcuatum* (Bull.: Fr.) Maire, Etude, synth. Genre *Tricholoma*: 27. 1916. — *Melanoleuca arcuata* (Bull.: Fr.) Sing. in Cavanillesia 7: 128. 1935.

var. *cognata* — Fig. 6

Selected illustrations. — Cetto, Funghi Vero 1, pl. 144. 1975; Bres., Iconogr. mycol. 3, pl. 120. 1928; Konr. & M., l.c.; J. Lange, Fl. agar. dan. 1, pl. 30A. 1935; R. Phillips, Mushr. other Fungi: 45. 1981.

Selected descriptions. — Bresinsky & Stangl in Z. Pilzk. 43: 512. 1977; Kühner in Bull. mens. Soc. linn. Lyon 47: 31. 1978.

Basidiocarps medium-sized to large, solitary. Pileus 50–105 mm, at first convex, becoming applanate, with low broad umbo, with margin long staying inflexed, fleshy, orange-yellow to rather dark brown (Mu. 10 YR 4–8/6), slightly darker brown at centre,

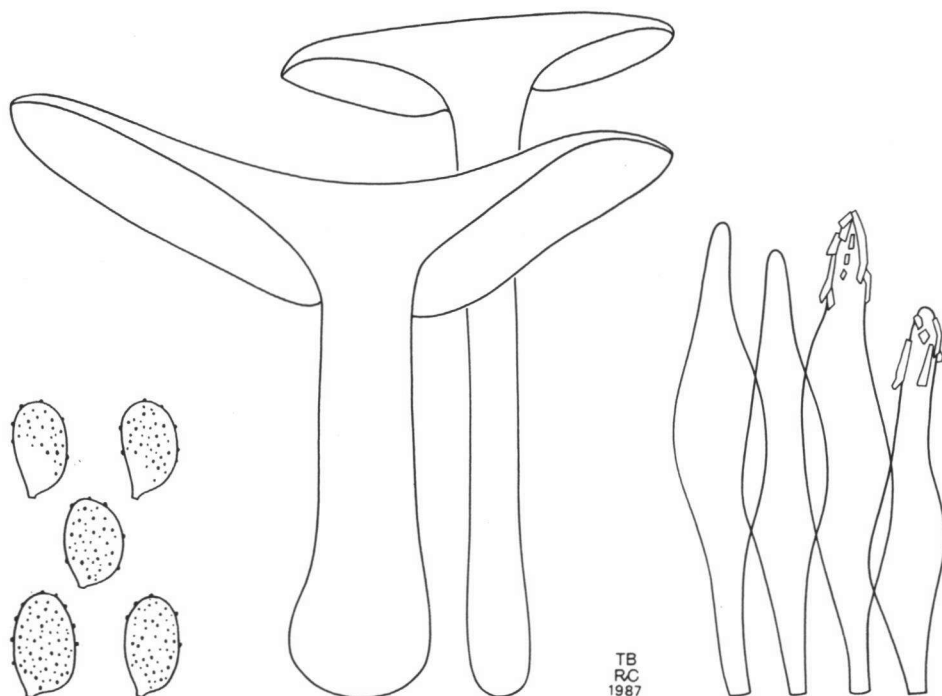


Fig. 6. *Melanoleuca cognata*. — Habit ($\times 1$). — Spores ($\times 1500$). — Cheilocystidia ($\times 1000$).

becoming greyish tinged with age, dry or slightly viscid, glabrous, but when young finely pruinose at margin, translucently striate when moist. Lamellae crowded ($L \cong 65$, $l = 1-3$), emarginate or sinuose, triangular or ventricose, thin, up to c. 10 mm wide, orange-yellow to salmon buff (Mu. 7-8/6-8), with edge entire or occasionally somewhat eroded. Stipe 50-140 \times 6-11 mm, cylindrical, with up to 18 mm wide clavate base, stuffed, with loose fibrillose medulla, ochraceous brown (Mu. 10 YR 7/6), fibrillose-striate, at apex white flocculose. Context of pileus pale yellowish brown (K. & R. 3A2), of stipe yellow-brown (Mu. 10 YR 6/6). Smell weak, pleasant, herbaceous or fungoid. Taste mild or somewhat adstringent-herbaceous. Spore print pale cream (Romagnesi, Les Russules, 1b-2a).

Spores (6.8-)7.1-9.5 \times 4.1-5.8(-6.2) μm , $Q = 1.4-1.9$, ellipsoid to elongate, densely ornamented with small amyloid warts, sometimes with some smooth areas. Basidia 25-40 \times 8-10 μm , clavate, 4-spored. Cheilocystidia 40-75 \times 10-15 μm , fusiform, sometimes somewhat lageniform, with acute or occasionally obtuse apex, with thickened cell wall and with apex usually encrusted by crystals. Pleurocystidia similar to cheilocystidia. Pileipellis somewhat intermediate between a cutis and a trichodermium, made up of slender hyphae; upper part of pileitrama compact, made up of 5-15 μm wide hyphae, with intracellular pale brown pigment. Apex of stipe with lumps of clavate cells and fusiform caulocystidia, 45-90 \times 8-13 μm .

Habitat & distribution. — Terrestrial in both broad-leaved and coniferous forests on rich soils, at roadsides and also on somewhat disturbed places. Basidiocarps occur mainly in spring. In the Netherlands not very rare, known from calcareous dunes, from the Flevopolders and from some places in the central and eastern parts of the country.

Collections examined. — NETHERLANDS: prov. Overijssel: Deventer, estate 'Wijtenhorst', 16 Nov. 1969, G. & H. Piepenbroek s.n.; Markelo, 18 April 1971, G. & H. Piepenbroek s.n.; prov. Flevoland, Oostelijk Flevoland, de Abbert, 15 April 1984, F. & G. Tjallingii s.n.; prov. Noord-Holland, Hilversum, 'Anna's Hoeve', 13 May 1973, P. van Winden s.n.; prov. Zuid-Holland, Naaldwijk, estate 'Staalduin', 7 April 1974, C. Bas 6306; Wassenaar, Meyendel, 14 Oct. 1979, C. Bas 7567A (all L). — FRANCE: *Métrod* 2744 and notes on *Métrod* 626, 1429, 2046 and *Métrod* s.n., 14 May 1939 (all PC).

Melanoleuca cognata is easily recognized by its ochraceous brown colours, its long stipe, its pleasant smell and its main occurrence in spring. Plate 271 of Konrad & Maublanc (l.c.) differs considerably from the other cited plates of Lange (l.c.) and Bresadola (l.c.). The former showing sordid coloured basidiocarps, while the basidiocarps depicted on the plates of Lange and Bresadola have bright orange-yellow colours. However, within the material studied we observed the entire range from orange-yellow (Mu. 10 YR 4-8/6) to rather dark yellowish brown basidiocarps. According to Bon (1978: 64) *M. cognata* sensu Konrad & Maublanc has fusiform cystidia, while *M. cognata* sensu Lange and sensu Bresadola has more lageniform cystidia. This is in contradiction with the morphology of the cheilocystidia as given by both Lange and Bresadola. The cystidia of *M. cognata* as depicted by these authors differ only slightly from those present by Konrad & Maublanc in having the broadest width just below the middle.

Bulliard's plate of *Agaricus arcuatus* (pl. 589, 1793), published under the name 'Agaric arqué' and without descriptive notes, seems to represent our *M. cognata*. Whereas his later descriptions (1812: 595) of *A. arcuatus* seems to concern a different species with a very dark pileus ('son chapeau est ordinairement de couleur bistré, quelquefois

d'un gris-bistre ou d'un bistre un peu lie-de-vin, quelquefois entièrement d'un brun-noirâtre ou seulement brunâtre dans le centre et bistre sur ses bords').

Agaricus arcuatus Bull.: Fr. sensu Fr. (1821: 109) is also not identical with our *M. cognata* because of its reddish, squamulose pileus ('pileo testaceo subrufescente, disco squamuloso').

Melanoleuca adstringens (Pers.) Métrod sensu Kühn. & Romagn. (1953: 146) is related to *M. cognata* because of its isabella coloured pileus, its salmon tinged ochre lamellae and similar spores and cystidia. It differs, however, by a strong, unpleasant smell and taste.

The original *Agaricus adstringens* Pers. (1801: 350), however, is a different species, because of its very dark pileus (according to Persoon's description 'pileo fuligineo-cinereo'). Konrad (1923: 29) also described the pileus of *Tricholoma adstringens* as 'fuligineux-cendré-olivâtre'. For these reasons and because we believe *M. adstringens* sensu Kühner & Romagnesi to be an infraspecific taxon of *M. cognata* we propose the following variety:

***Melanoleuca cognata* var. *nauseosa* Boekhout, var. nov. — Fig. 7**

Misapplied names. — *Gyrophila adstringens* (Pers.) Quél., Fl. mycol. France: 267. 1888 — *Melanoleuca adstringens* (Pers.) Métrod in Bull. trimest. Soc. mycol. Fr. 64: 163. 1948.

Selected descriptions. — Bon & Chevassut in Docum. mycol. 9: 48. 1973; Kühn. & Romagn., Fl. anal. Champ. sup.: 146. 1953.

A var. *cognata* differt stipite brevior et odore forti suavi, ingrato, *Tricholoma sulfureum* vel *Clitocybium nebulare* simulante.

Holotypus: A. N. Koopmans 409, 11 Sept. 1962 (L).

Collections examined. — NETHERLANDS: prov. Gelderland, locality unknown, 11 Sept. 1962, A. N. Koopmans 409 (L).

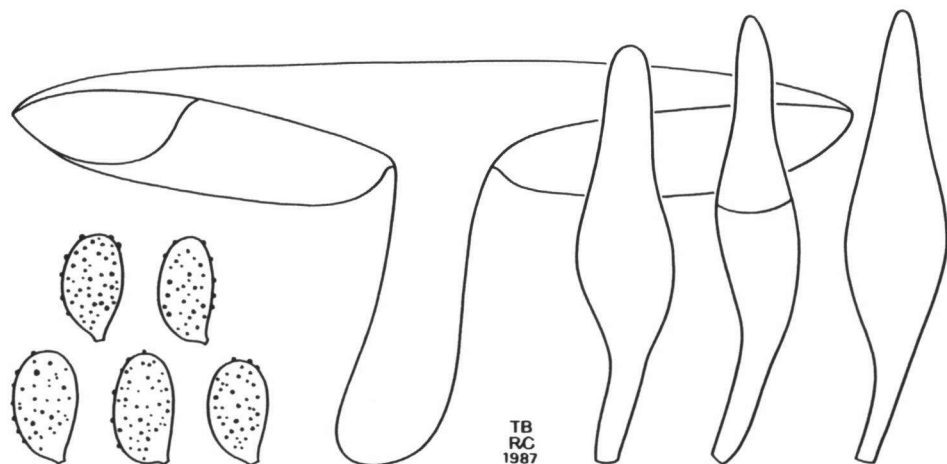


Fig. 7. *Melanoleuca cognata* var. *nauseosa*. — Habit (×1). — Cheilocystidia (×1000).

Differs from the typical variety by a short stipe, which is shorter or equal to the diameter of the pileus, a strong sweet smell with unpleasant components, which reminds of coal-gas and the smell of *Tricholoma sulfureum* or *Clitocybe nebularis* and an unpleasant taste which strongly reminds the smell.

Habitat & distribution. — Terrestrial in coniferous forest, basidiocarps occurring in autumn. In the Netherlands very rare, only known from one locality in the prov. Gelderland.

Subgen. *Macrocystis* sect. *Alboflavidae*

Melanoleuca nivea Métrod ex Boekhout, *spec. nov.* — Fig. 8

Melanoleuca nivea Métrod (nom. nud.) in Bull. Soc. Nat. Oyonnax 14-15: 140. 1960-1961. Misapplied. — *Tricholoma media* (Paul.) Brébinaud in Bull. trimest. Soc. mycol. Fr. 42: 121. 1926. — *Melanoleuca media* (Paul.) Bon in Docum. mycol. 33: 60. 1978.

Selected illustrations. — Cooke, Ill. Brit. Fungi 1, pl. 219. 1883 (sub *Agaricus* (*Tricholoma*) *subpulverulentus* Fr.).

Basidiocarpus parvus. Pileus 30–50 mm, convexus vel applanatus, umbone humili praeditus, albus, nonnumquam in maculis ochraceis. Lamellae densae, ventricosae, tenues, albae vel dilute cremae. Stipes 30–55 × 4–7.5 mm, albidus vel dilute bubalinus, ad apicem pruinosis. Contextus albidus, in stipite brunneus vel aurantio-brunneus, ad ultimam basim fuscissimus. Odor et sapor indistincti. Sporae in cumulo luteo-albae, 6.8–9.1 × 4.0–4.9 μ m, verrucis fere grossis amyloideis dense ornamentatae. Cheilocystidia et pleurocystidia fusiformia. Species terrestris, in pratis dunensibus crescit.

Holotypus: Métrod 2434 (PC).

Basidiocarps small, solitary or in small groups. Pileus 30–50 mm, convex to applanate, mostly with low broad umbo, with the margin somewhat inflexed and slightly exceeding lamellae, white, sometimes with some ochraceous spots, slightly viscid when moist, shiny, glabrous. Lamellae crowded ($L = 45-60$, $l = 2-7$), emarginate to sinuose, triangular or ventricose, thin, up to 8 mm wide, whitish or pale cream, occasionally with a faint pinkish reflex, with concolorous, entire to minutely flocculose edge. Stipe 30–55 × 4–7.5 mm, cylindrical, somewhat broadening towards base, occasionally somewhat flattened, stuffed, whitish to pale greyish beige (Mu. 10 YR 7/3), finally becoming greyish in upper part and brownish towards base (Mu. 10 YR 4/4), entirely longitudinal striate, when young whitish pruinose, soon glabrous in lower part. Context of pileus whitish, brown to orange-brown in upper part of stipe, turning dark brown towards base. Smell faint, somewhat rancid. Taste weak, unpleasant. Spore print yellowish white (Mu. 2.5 Y 8/2).

Spores 6.8–8.4(–9.1) × 4.0–4.9 μ m, $Q = 1.5-2.0$, elongate, moderately densely ornamented with rather coarse amyloid warts, with suprahilar plage. Basidia 23–33 × 7–9 μ m, clavate, 4-spored. Cheilocystidia (35–)40–65 × 9–15(–20) μ m, fusiform, partly tending to lageniform, mostly with the apex acute and encrusted by crystals. Pleurocystidia similar to cheilocystidia. Pileipellis a c. 40 μ m thick ixotrichoderm, made up of 3–4 μ m wide hyphae, upper part of the pileitrama compact and without pigment. Apex of stipe with lumps of clavate cells and fusiform to lageniform caulocystidia, 70 × 10–15 μ m in size.

Habitat & distribution. — Terrestrial in grasslands on coastal dunes. Rather rare: in the Netherlands only known from coastal regions.

Collections examined. — NETHERLANDS: prov. Friesland: isle of Terschelling, Midsland, 21 Oct. 1981, *M. E. Noordeloos 1629*; ditto, 25 Oct. 1982, *T. Boekhout 1059*; ditto, West Terschelling, 19 Oct. 1981, *M. E. Noordeloos 1610*; prov. Noord-Holland, Santpoort, 'Duin en Kruidberg', 28 Nov. 1981, *A. G. Becker s.n.*; prov. Zuid-Holland: Westvoorne, 'Weevers Duin', 5 Nov 1927, *H. S. C. Huysman 326*; ditto, 20 Oct. 1963, *C. Bas 4007* (all L). — FRANCE: 3 Nov. 1951, *Métrod 2434* (type, PC).

Melanoleuca nivea is well characterized by its small whitish basidiocarps with grey-brown stipe, fusiform cystidia and rather small spores.

Brébinaud (1926: 121) presented a description of *M. nivea* under the name *Tricholoma media* (Paul.) Brébinaud. But the original plate of *Hypophyllum medium* Paul. (cf. Leveillé, 1855: pl. 96 figs. 1, 2) shows a rather coarse fungus with a grey-brown pileus and a white stipe and therefore hardly comparable to *M. nivea*. For that reason I prefer to validate Métrod's name (published without a Latin diagnosis) which is based on a good type collection.

Bon (1978: 60) transferred Brébinaud's *Tricholoma media* to *Melanoleuca*, but ignored Brébinaud's description of the cystidia ('cystides caractéristiques en lancette avec le sommet chevelu, $50 \times 12-13 \mu\text{m}$ ') by placing it into stirps *Grammopodia* which is characterized by urticiform cystidia.

Melanoleuca nivea belongs to subgenus *Macrocystis* section *Alboflavidae*. It differs from other whitish *Melanoleuca* species mainly by its small basidiocarps (see Table III).

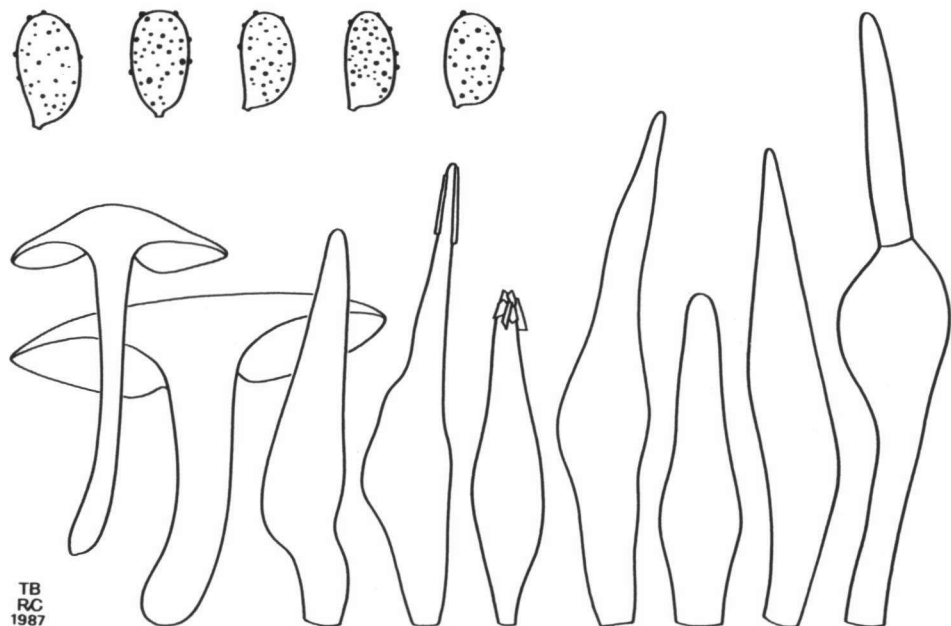


Fig. 8. *Melanoleuca nivea*. — Habit ($\times 1$). — Spores ($\times 1500$). — Cheilocystidia ($\times 1000$).

Table. III. Diameter of the pileus of species from section *Alboflavidae* Sing.

species	diameter of pileus in mm	reference
<i>M. alboflavidum</i>	50–140	Weaver & McLaughlin 1980: 49
<i>M. cnista</i> sensu Quélet	80–100	Bon 1978: 61
<i>M. evenosa</i> sensu Métrod	50–80 (–100)	Bon 1978: 61
<i>M. kavinae</i>	60–140	Pilát & Veselsky 1932: 476
<i>M. nivea</i>	30–50	(own observations)
<i>M. parisianorum</i>	(50–) 60–80	Bon 1978: 61
<i>M. pascua</i> ad. int.	60–115	Malençon & Bertault 1975: 81
<i>M. strictipes</i> sensu Bresinsky & Stangl	90	Bresinsky & Stangl 1977: 156
<i>M. subalpina</i>	120	Bresinsky & Stangl 1977: 160
	80–120 (–140)	Bon 1978: 61

Subgen. *Macrocyttis* sect. *Strictipedes**Melanoleuca atripes* Boekhout, *spec. nov.* — Fig. 9

Melanoleuca nigripes Métrod (nom. nud.) in Bull. trimest. Soc. mycol. Fr. 64: 164. 1948.

Selected illustration n. — Métrod l.c., pl. 1, fig. 9.

Selected description n. — Pázmány in Beitr. Kenntn. Pilze Mitteleur. 3: 131. 1987.

Basidiocarpus magnitudine parvus vel medius. Pileus 20–70 mm, convexus vel applanatus, modice depressus, hygrophanus, humidus obscure fuscus, desiccans pallidior, glaber. Lamellae fere densae, ventricosae, brunneo-bubalinae, margine concolori. Stipes 35–50 × 4–5 (–8) mm, cylindricus, primum dilute et sordide luteo-bubalinus, deinde fuscescens, sursum albidus flocculosus. Contextus dilute bubalinus, in stipite luteolo-brunneus. Odor et sapor indistincti. Sporae in cumulo albae, sporae 6.2–7.7 × 4.0–4.8 μ m, ellipsoideae, verrucis fere grossis amyloideis praeditae. Basidia 30–40 × 8–10 μ m, 4-spora. Cheilocystidia et pleurocystidia 45–70 × 10–20 μ m, fusiformia.

Holotypus: 'J. Schreurs s.n., 22 XI 1982, Winterswijk' (L).

Basidiocarps small to medium-sized, solitary. Pileus (20–)30–70 mm, at first convex, soon becoming applanate, finally with depressed centre, when young with inflexed margin, rather fleshy hygrophanous, when moist dark blackish brown (Mu. 10 YR 2/1), becoming paler on drying, then with centre dark brown (Mu. 5 YR 3/2) and margin yellowish brown (Mu. 7.5 YR 3–4/4), with waxy surface, becoming dull when dry, glabrous, when young with margin greyish pruinose. Lamellae rather crowded ($L \cong 45$, $l = 3-6$), sinuose, triangular-ventricose to ventricose, rather thick, up to c. 7 mm wide, brownish beige (Mu. 10 YR 6/4), with entire, concolorous edge. Stipe 35–50 × 4–5 (–8) mm, cylindrical, stuffed, at first pale sordid yellowish beige (Mu. 10 YR 7/3), becoming dark brown (Mu. 10 YR 4/3), longitudinally striate, at apex whitish flocculose. Context of pileus pale beige, yellowish brown in stipe, when young in lower part of stipe yellowish (Mu. 10 YR 6/8). Smell indistinct, fungoid. Taste indistinct. Spore print whitish (Romagnesi, Les Russules, 1a-b).

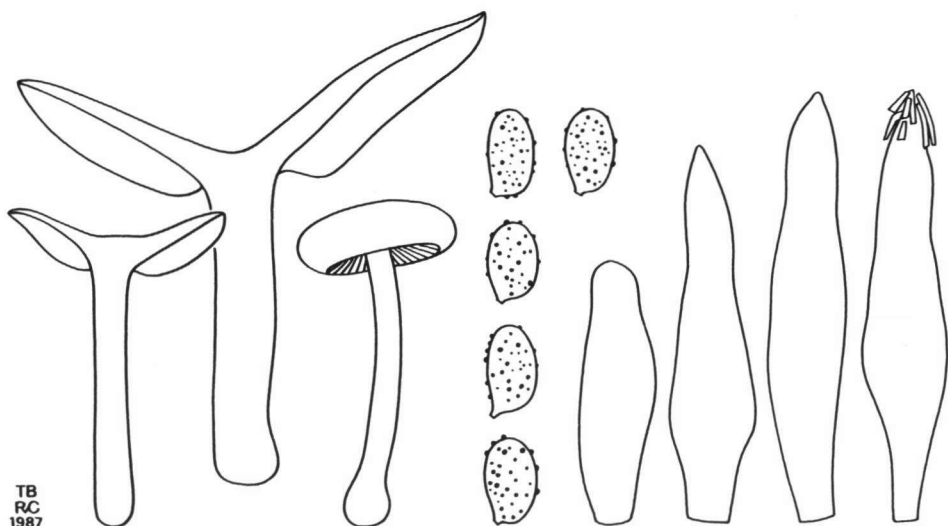


Fig. 9. *Melanoleuca atripes*. — Habit ($\times 1$). — Spores ($\times 1500$). — Cheilocystidia ($\times 1000$).

Spores $6.2-7.7 \times 4.0-4.8 \mu\text{m}$, $Q = 1.5-1.8$, ellipsoid, densely ornamented with rather coarse, amyloid warts, with small suprahilar plage. Basidia $30-40 \times 8-10 \mu\text{m}$, clavate, 4-spored. Cheilocystidia $45-70 \times 10-20 \mu\text{m}$, fusiform, with apex subacute and encrusted by crystals. Pleurocystidia similar to cheilocystidia. Pileipellis somewhat intermediate between a cutis and a trichoderm, up to c. $40 \mu\text{m}$ thick, made up of $8-12 \mu\text{m}$ wide hyphae with intracellular yellow-brown pigment. Apex of stipe with fusiform to lageniform caulocystidia, $50-70 \times 6-13 \mu\text{m}$ in size.

Habitat & distribution. — Very rare, in the Netherlands only known from type locality (a kitchen garden).

Collections examined. — NETHERLANDS: prov. Gelderland, Winterswijk, 22 Nov. 1982, *J. Schreurs s.n.* (L). — FRANCE: Jura, Champagnole, 19 Oct. 1943, *Métrod 1388* (PC).

Melanoleuca atripes is characterized by a hygrophanous blackish brown pileus, a dark brown stipe, yellowish beige lamellae, rather short ellipsoid spores and fusiform cystidia. In these aspects the Netherlands' specimen agrees well with the description of *M. nigripes* Métrod (1949: 164), with the exception of the colour of the context described by Métrod as nearly black. In his illustration of the species (l.c.: pl. 1 fig. 9) the context, however, is sordid isabella brown, which agrees again with the Netherlands' material.

As Métrod's original collection of his *M. nigripes* is very poor, I prefer to describe a new species with better type material.

Pázmány's description (l.c.) agrees well with ours except that the spores of the Rumanian specimen are larger, viz. $8-9 \times 5.2-6 \mu\text{m}$ and the context of its stipe is blackish.

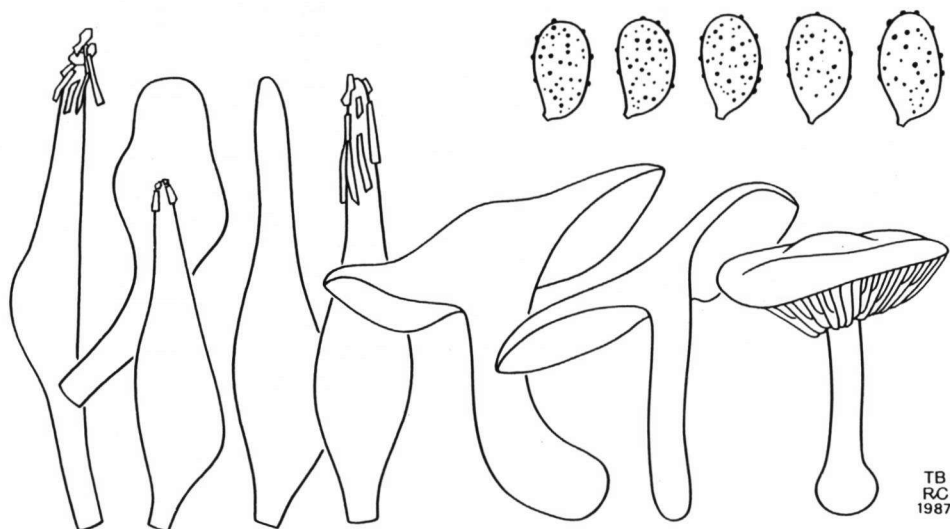


Fig. 10. *Melanoleuca albifolia*. — Habit ($\times 1$). — Spores ($\times 1500$). — Cheilocystidia ($\times 1000$).

Melanoleuca albifolia Boekhout, *spec. nov.* — Fig. 10

Melanoleuca leucophylla Métrod (nom. nud.) in Bull. trimest. Soc. mycol. Fr. 64: 161. 1948.

Selected illustration. — Métrod l.c.: pl. 1, fig. 8. 1948.

Selected descriptions. — Bon in Docum. mycol. 3: 39. 1972; Docum. mycol. 33: 66. 1978; Pázmány in Beitr. Kenntn. Pilze Mitteleur. 3: 130. 1987.

Basidiocarpus magnitudine parvus vel medius. Pileus 25–50 mm, convexus vel plano-convexus, umbone humili praeditus, hygrophanus, humidus obscure rubello vel olivaceo-sepiaceus, desiccans pallidior. Lamellae densae, ventricosae, albae vel dilutissime cremeae. Stipes 15–65 \times 4–7 mm, cylindricus, primum dilute bubalinus, deinde ad griseo-brunneum fuscescens. Contextus dilute luteo-brunneus, ad basim stipitis fuscescens. Odor et sapor indistincti. Sporae in cumulo albae, sporae 7.0–9.5 \times 4.3–5.1 μ m, ellipsoideae vel elongatae, verrucis grossis amyloideis praeditae. Basidia 4-spore. Cheilocystidia et pleurocystidia 45–70 \times 10–16 μ m, lageniforma, ad apicem subacuta.

Holotypus: 'C. Bas s.n., 25 Nov. 1982, Vogelenzang (L).'

Basidiocarpus small to medium-sized, solitary or in small groups. Pileus 25–50 mm, convex to plano-convex, finally with depressed centre, with low broad umbo, when young with involute margin, sometimes slightly exceeding lamellae, hygrophanous, when moist dark reddish to olivaceous sepia-brown (Mu. 10 YR 2–3/2), paler towards margin, finally becoming pale yellowish brown (Mu. 10 YR 6–7/3), when moist subviscid and shiny, when dry dull, glabrous. Lamellae rather crowded ($L = 30\text{--}55$, $l = 1\text{--}5$), emarginate to sinuose, triangular-ventricose to ventricose, c. 6 mm wide, white to very pale cream, with entire, concolorous edge. Stipe (15–)25–65 \times 4–7 mm, cylindrical, stuffed, when young pale greyish beige (Mu. 10 YR 7/4–8/3), becoming dark grey-brown (Mu. 10 YR 2–4/2) with age, longitudinally striate, with whitish flocculose apex. Context of pileus pale yellowish brown, in upper part of stipe brown, becoming dark brown towards base, with cortex greyish in upper part. Smell weak, fungoid or faintly rancid. Taste weak. Spore print white (Romagnesi, Les Russules, 1a-b).

Spores $7.0-9.5 \times 4.3-5.1 \mu\text{m}$, $Q = 1.5-1.9$, ellipsoid to elongate, densely ornamented with rather coarse amyloid warts, with small suprahilar plage. Basidia $25-35 \times 8-10 \mu\text{m}$, (2-)4-spored. Cheilocystidia $(35-45-70 \times 10-16 \mu\text{m})$, lageniform with subacute apex, partly also fusiform, at apex encrusted with crystals. Pleurocystidia similar to cheilocystidia. Pileipellis a c. $40 \mu\text{m}$ thick ixotrichoderm made up of $2-4 \mu\text{m}$ wide hyphae, upper part of pileitrama compact with intracellular yellow-brown pigment. Apex of stipe with clusters of clavate cells and lageniform caulocystidia, $55-70 \times 10-20 \mu\text{m}$ in size.

Habitat & distribution. — Terrestrial in grasslands on dunes. Rare in the Netherlands, only known from the coastal area.

Collections examined. — NETHERLANDS: prov. Friesland, isle of Terschelling, Boschplaat, 'Stuifduik', 26 Oct. 1982, *T. Boekhout 1060*; prov. Noord-Holland, Vogelenzang, water-supply dunes, 24 Oct. 1981, *C. Bas 7853*; ditto, 25 Nov. 1982, *C. Bas s.n.* (type L). — FRANCE: Jura, Champagnole, 1 Nov. 1943, *Métrod 1407* (PC).

Melanoleuca albifolia is well characterized by rather small basidiocarps with a dark pileus, white lamellae, a grey-brown stipe and lageniform cystidia.

Because *M. leucophylla* was not correctly published and the original collections of Métrod contains only very poor fragments I prefer to describe this taxon as a new species under the name *M. albifolia*.

Melanoleuca polioleuca var. *fragillima* (Bon, 1978: 73, sub *M. humile* var. *fragillima*) is related, but differs by a less dark pileus, a more whitish stipe and more fusiform cheilocystidia.

Melanoleuca subpulverulenta sensu Bresinsky & Stangl (1977: 161) seems related too, but that species differs by a more grey pileus and shorter spores (viz. $6.5-7.0 \times 5.0-5.5 \mu\text{m}$).

Melanoleuca turrita (Fr.) Sing. — Fig. 11

Agaricus turritus Fr., Epicr.: 51. 1836-1838. — *Gyrophila turrita* (Fr.) Quél., Fl. mycol. France: 266. 1888. — *Tricholoma grammopodia* var. *turrita* (Fr.) Maire, Étude synth. Genre *Tricholoma*: 29. 1916. — *Tricholoma turrita* (Fr.) Nuesch, Die Ritterlinge: 146. 1923. — *Melanoleuca turrita* (Fr.) Sing. in Ann. mycol. 41: 55. 1943.

Tricholoma humile f. *robusta* Bres., Iconogr. mycol. 3: pl. 128. 1928. — *Melanoleuca humile* var. *robusta* (Bres.) Bon in Docum. mycol. 33: 75. 1978.

?*Melanoleuca humile* (Pers.: Fr.) Pat. sensu Métrod in Bull. trimest. Soc. mycol. Fr. 64: 158. 1948.

Selected illustrations. — Bresadola, l.c.

Selected description. — Mal. & Bert., Fl. Champ. sup. Maroc 2: 83. 1975.

Basidiocarps medium-sized, solitary or connate. Pileus up to 70 mm, at first convex, becoming convex with undulating margin, finally with depressed centre, when young with inflexed margin, thick-fleshed, hygrophanous, when moist with centre dull olivaceous brown with a faint reddish tinge (Mu. 10 YR 3/4, 4/3), towards margin dark greyish-bluish black (Mu. 5 YR 2.5/1-2), outermost margin whitish, on drying becoming grey-brown (Mu. 10 YR 5-6/3), glabrous, dry, with margin sulcate and greyish pruinose. Lamellae crowded ($L \cong 70$, $l = 7-11$), sinuose, ventricose, thin, c. 7 mm wide, greyish white with a faint yellowish pink or pink tinge (Mu. 5 Y 8/1), with entire, concolorous

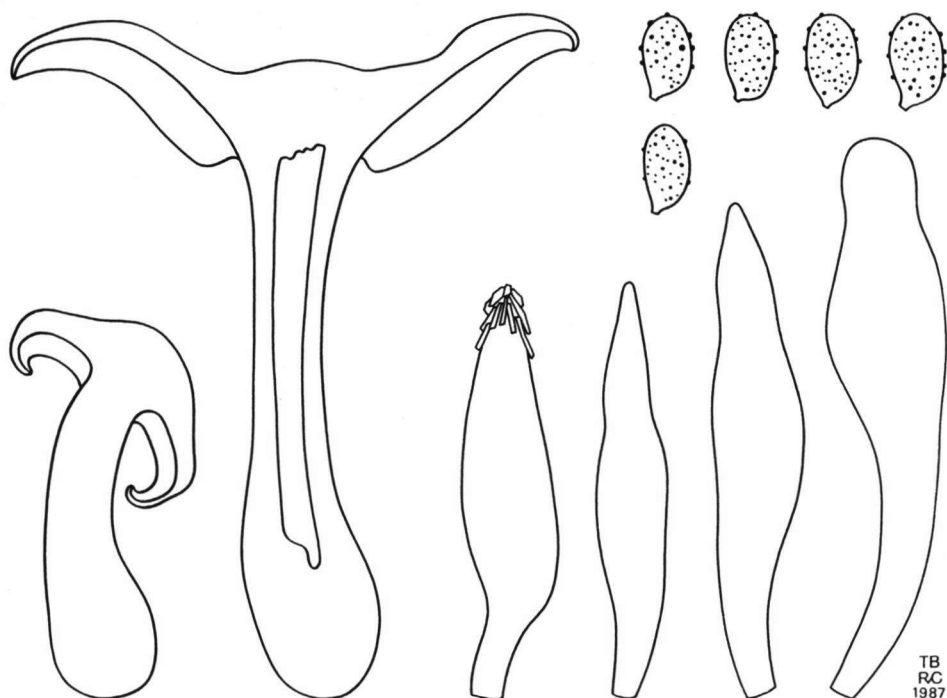


Fig. 11. *Melanoleuca turrita*. — Habit ($\times 1$). — Spores ($\times 1500$). — Cheilocystidia ($\times 1000$).

edge. Stipe 40–70 \times 9 mm, cylindrical, with up to 20 mm wide, clavate base, stuffed, becoming fistulose, dark grey-brown (Mu. 10 YR 4–5/3), longitudinally striate, at apex densely flocculose, less densely flocculose towards base, at base with appressed white mycelium. Context when young white, becoming yellowish to greyish white, just under pileipellis blackish, in base of stipe dark ochraceous brown, finally with cortex of stipe becoming dark ochraceous brown (Mu. 10 YR 6/6). Smell weak, fungoid. Taste slightly rancid. Spore print white.

Spores 7–8 \times 4–5 μm , $Q = 1.4$ –1.8, ellipsoid to elongate, densely ornamented with small, partly somewhat elongate warts, with suprahilar plaque. Basidia 30–40 \times 7–9 μm , clavate, 4-spored. Cheilocystidia 50–70 \times 10–14 μm , fusiform to conical with acute or occasionally obtuse apex encrusted with crystals. Pleurocystidia similar to cheilocystidia. Pileipellis a c. 50 μm thick ixotrichoderm, made up of slender hyphae with clavate terminal cells, measuring 25–35 \times 2–5 μm , upper part of pileitrama compact, with intracellular pale brown pigment. Apex of stipe with fusiform caulocystidia, 70–90 \times 10–15 μm .

Habitat & distribution. — On wood chips of ornamental shrub. Very rare; in the Netherlands only known from one locality. Because of the abundance of the substrate, nowadays commonly used in gardening, probably more common.

Collections examined. — NETHERLANDS: prov. Zuid-Holland, Leiden, railway station Lammenschans, 2 Nov. 1982, *T. Boekhout* 1077 & *C. Bas* 8048 (L).

Melanoleuca turrita as described here, fully agrees with Bresadola's plate 128 (1928) of *Tricholoma humile* f. *robusta* Bres. and is well characterized by connate basidiocarps, a dark pileus with a peculiar dull aspect, a grey-brown stipe and conical to fusiform cystidia.

Melanoleuca humile sensu Métrod (1949: 158) agrees fairly well with our specimen, although the surface of the pileus is described by that author as tomentose, whereas in our specimen it is peculiar waxy.

As stated by Métrod (l.c.) several interpretations exist of *Agaricus humilis* Pers.: Fr. *Agaricus humilis* as described by Persoon (1801: 360) is a robust, short-stiped fungus with a dark ('fuscescente'), slightly squamulose ('obsolete squamuloso') pileus, more or less greyish lamellae and a short (c. 27 × 9 mm), greyish pruinose stipe. This reminds very much the morphology of e.g. *M. brevipes* (Bull.: Fr.) Pat. According to Fries (1815: 11; 1821: 51) *A. humilis* Pers.: Fr. also is a short-stiped, robust fungus, but he described the lamellae as whitish. No authentic material is present in the herbarium Persoon (L). Several interpretations of *M. humilis* mainly differ in their microscopical characteristics e.g. those of Singer (1943: 51), Métrod (1949: 158), and Bresinsky & Stangl (1977: 153). It is hardly possible to select one of these interpretations as representing the true *A. humilis* of Persoon, because they all more or less agree with Persoon's macromorphological concept of this species. Therefore we consider *A. humilis* an ambiguous name.

Melanoleuca turrita (Fr.) Sing. (1943: 55; Moser 1978: 143) is identical with our fungus. *Tricholoma turrita* sensu Nuesch (1923: 146), however, differs from our fungus by the soon very soft, blackish context. Moreover, the two plates from Britzelmayer (1881: plates 304 and 429) cited by Nuesch seem to represent two different species. I do not understand why Bon (1978: 53) placed *M. turrita* (Fr.) Sing. in section *Grammopodiae*, which is characterized by urticiform cystidia. Singer (l.c.) described the cystidia as 'spindelformig' and he referred to *Tricholoma humile* sensu Bresadola (1928: 128), which has fusiform cystidia too.

Melanoleuca polioleuca (Fr.: Fr.) Kühn. & Maire

Agaricus melaleucus var. *polioleuca* Fr.: Fr., Syst. mycol. 1: 115. 1821. — *Tricholoma melaleuca* var. *polioleuca* (Fr.: Fr.) Gillet, Hyménomycètes: 128. 1874. — *Melanoleuca polioleuca* (Fr.: Fr.) Kühn. & Maire in Bull. trimest. Soc. mycol. Fr. 50: 18. 1934.

Melaleuca vulgaris Pat., Hyménomycètes d'Europe: 96. 1887. — *Melanoleuca vulgaris* (Pat.) Pat., Essai tax. Hyménomycètes: 159. 1900.

Excluded. — *Melanoleuca polioleuca* sensu Mos., Blätter- und Bauchpilze, 4. Aufl.: 141. 1978.

Misapplied names. — *Tricholoma arcuata* sensu Rick., Blätterpilze: 356. 1915. — *Melanoleuca arcuata* sensu Sing. in Cavanillesia 7: 128. 1935. — *Melanoleuca arcuata* sensu Mos., Blätter- und Bauchpilze, 1. Aufl.: 69. 1953. — *Tricholoma melaleuca* sensu Maire, Étude synth. Genre *Tricholoma*: 23. 1916. — *Melanoleuca melaleuca* sensu Mos., Blätter- und Bauchpilze, 1. Aufl.: 69. 1953.

forma *polioleuca*

Selected illustrations. — Däncke & Däncke 700 Pilze: 204. 1979; J. Lange, Fl. agar. dan. 1, pl. 29A. 1935; R. Phillips, Mushr. other Fungi: 45. 1981 (as *M. arcuata* and *M. melaleuca*).

Selected descriptions. — Arnolds, Ecol. Coenol. Macrofungi Grassl. Heathl. Drenthe, Netherlands 3: 402. 1982 (as *M. melaleuca*); Bon in Docum. mycol. 33: 74. 1978 (as *M. vulgaris*); Bresinsky & Stangl in Z. Pilzk. 43: 150 (as *M. arcuata*), 155 (as *M. melaleuca*). 1977; Kühner in Bull. mens. Soc. Linn. Lyon 47: 28. 1978; Métrod in Bull. trimest. Soc. mycol. Fr. 64: 162. 1948 (as *M. vulgaris*).

Basidiocarps medium-sized, solitary. Pileus 25–70(–85) mm, at first convex, becoming plano-convex to applanate, finally with somewhat depressed centre, mostly with low broad umbo, with margin somewhat involute but at age uplifted, rather fleshy, somewhat hygrophalous, dull, when moist yellowish brown to dark grey-brown (Mu. 10 YR 4/3–5/3), frequently with slight olivaceous or reddish tinge, paler towards margin, becoming paler on drying on to greyish brown (Mu. 10 YR 5/3), with surface dry or slightly viscid, glabrous but with margin whitish pruinose and occasionally translucently striate. Lamellae crowded, L = 40–75, l = 1–7, adnate to sinuose, mostly with subdecurent toothlet, ventricose to triangular, thin, (2–)4–9 μ m wide, whitish, becoming pale cream (Mu. 2.5 Y 8/2–4) or somewhat greyish white (Mu. 10 YR 8/1–2), with entire, concolorous edge. Stipe 35–85(–150) \times 3–8(–11) mm, cylindrical with up to 16 mm wide clavate base, stuffed, at first whitish, becoming pale to sordid grey-brown (Mu. 10 YR 7/2–4, 6/4), towards base becoming brown, dark grey-brown or blackish brown (Mu. 10 YR 3/2–3, 4/3), innately longitudinal striate, at apex white flocculose. Context of pileus whitish, occasionally yellowish brown, just below pileipellis brown, becoming brownish towards base of stipe and nearly blackish brown in extreme base, very rarely entirely whitish. Smell weak, pleasant, farinaceous or somewhat raphanoid. Taste weak, mild, farinaceous rancid or somewhat bitterish. Spore print whitish with a faint cream tinge (Romagnesi, Les Russules, 1a-b).

Spores (5.7–)6.3–9.0(–9.5) \times 4.0–5.0(–5.4) μ m, Q = 1.3–1.9, ellipsoid to elongate, rather densely ornamented with rather coarse, amyloid warts, with suprahilar plage. Basidia 25–40 \times 6–10 μ m, clavate, 4-spored. Cheilocystidia 45–75(–90) \times 8–15 μ m, fusiform with subacute apex, but partly also lageniform, at apex mostly encrusted with crystals. Pleurocystidia similar to cheilocystidia. Pileipellis an up to c. 100 μ m thick ixotrichoderm, made up of slender hyphae with obtuse or cystidioid terminal cells. Upper part of the pileitrama compact, with pale brown pigment. Apex of stipe with lumps of clavate cells and fusiform caulocystidia, 50–80(–95) \times 7–14 μ m.

Habitat & distribution. — Terrestrial in both broad-leaved and coniferous forests, in grasslands, mainly on rather rich sandy, clayey or loamy soils. Common in the Netherlands, occurring frequently in coastal dunes, in forests on clay in fluvial phyto-geographical district and in Flevo-polders.

Collections examined. — NETHERLANDS: prov. Friesland: Kootstertille, 19 Oct. 1982, *J. Wisman s.n.*; Leeuwarden, 22 Sept. 1972, *J. Wisman s.n.*, isle of Terschelling, Formerum, 25 Oct. 1982, *T. Boekhout 1058*; ditto, 'Kroonpolders', 27 Oct. 1982, *Th. W. Kuyper s.n.*; ditto, 'Noordvaarder', 27 Oct. 1982, *T. Boekhout 1064*; ditto, Formerum, 25 Oct. 1982, *T. Boekhout 1058*; prov. Gelderland: Apeldoorn, 'Berg en Bos', 18 Oct. 1958, *A. N. Koopmans 178*; Bennekom, 28 Sept. 1960, *J. Doorenbos s.n.*; prov. Utrecht, Bunnik, estate 'Oud Amelisweerd', 22 July 1954, *C. Bas 536*; prov. Flevoland: Noordoostpolder, 'Kuinderbos', 27 Oct. 1982, *L. Laarman s.n.*; Oostelijk Flevoland, 'Bremerbergbos', 5 Oct. 1981, *E. Jansen s.n.*; ditto, 7 Oct. 1981, *M. E. Noordeloos 1492*; ditto, 8 Oct. 1981, *M. E. Noordeloos 1495* and *1496*; ditto, 20 Nov. 1982, *G. Tjallingii-Beukers s.n.*; prov. Noord-Holland: Hilversum, 'Anna's Hoeve', 4 Dec. 1972, *P. van Winden 341*; Hilversum, 'vliegveld', 17 Oct. 1957, *J. Daams s.n.*; Wieringermeer, 'Robbenoord', 5 Oct. 1968, *J. Geesink s.n.*; prov. Zuid-Holland: Leiden, 'Leidse Hout', 25 July 1954, *R. A. Maas Geesteranus 10.005*; Scheveningen, 'de Hartenshoek', 2 Nov. 1981, *M. A. Brand s.n.*; Voorschoten, estate 'Ter Horst', 12

Oct. 1982, *E. C. Vellinga s.n.*; Westvoorne, Rockanje, 'Quackjeswater', 19 Oct. 1982, *T. Boekhout 1043*; Wassenaar, 'Rust en Vreugd', 6 Nov. 1983, *Th. W. Kuyper 2498*; prov. Zeeland: Kruiningen, 28 June 1985, *W. D. J. Kuys s.n.*; prov. Noord-Brabant: Dorst, 26 June 1972, *P. B. Jansen s.n.*; prov. Limburg, Gronsveld, 'Savelsbos', 11 Oct. 1970, *C. Bas 5459* (all L). — FRANCE: Notes of Métrod on the following specimens: *Métrod 265* (sub *M. friesii* Bres.); *478* (sub *M. phaeopodia* Bulliard); *616* (sub *M. phaeopodia* Bulliard); *697* (sub *M. vulgaris* Pat.); *1543* (sub *M. vulgaris* Pat. var. *phaeopodium*); *1985* (sub *M. vulgaris* Pat. var. *phaeopodium*); *1993* (sub *M. phaeopodia* Bulliard); *2034* (sub *M. polioleuca* Fr.); *2201* (sub *M. vulgaris* var. *phaeopodium*).

Melanoleuca polioleuca is interpreted here as a variable species. Within this complex many varieties (see Métrod 1949: 163) or even species (see Bon 1978: 74-75) have been distinguished. According to Bon (l.c.) *M. polioleuca* differs from *M. vulgaris* mainly by the brown context of the stipe in the former species, whereas *M. vulgaris* is claimed to have a white context. However, I observed within one population both specimen with a brown and with a white context of the stipe. Regarding other characters both forms are similar. Therefore we agree with Kühner & Romagnesi (1953: 147) that this character cannot be used to separate species in this complex. Consequently I include *M. vulgaris* sensu Bon in my concept of *M. polioleuca*.

In the literature *M. vulgaris* sensu Bon has often been referred to as *M. melanoleuca* (a.o. Arnolds 1982: 402). However, we follow Kühner (1978: 13), who pointed out that *Agaricus melaleucus* Pers.: Fr. (Persoon 1801: 355; Fries 1821: 114) most probably is an acystidiolate species, because of its glabrous stipe (according to Persoon l.c. 'stipe glaber').

Melanoleuca polioleuca sensu Cléménçon & Sing. (1972: 322) and Moser (e.g. 1978: 141) differs from our species by a pruinose pileus. This, however, is not reported by Fries (l.c. and 1874: 75).

Melanoleuca arcuata sensu Bresinsky & Stangl (1977: 150) differs mainly by a very dark pileus, but this I noticed also frequently in the specimen I studied (e.g. *Boekhout 1000* (L)), without finding any further differences. Therefore, I regard *M. arcuata* sensu Bresinsky & Stangl conspecific with *M. polioleuca*.

We studied notes and exsiccatae of specimen belonging to this complex from the collection Métrod (PC). *Melanoleuca vulgaris*, *M. vulgaris* var. *phaeopodium*, *M. phaeopodia* and *M. polioleuca* sensu Métrod all belong to the *M. polioleuca*-complex.

Among the specimens studied some aberrant forms occur, which have a remarkable short stipe or tiny basidiocarps. These are known in the literature as *M. (Tricholoma) brevipes* sensu J. Lange and *M. humile* var. *fragillima* (Fr.) Bon respectively. In my opinion both belong to *M. polioleuca* and are best regarded as forms of that species.

Melanoleuca polioleuca f. *langei* Boekhout, f. nov. — Fig. 12

Misapplied names. — *Melanoleuca arcuatum* sensu Ricken, *Blätterpilze*: 356. 1915. — *Tricholoma brevipes* sensu J. Lange, *Fl. agar. dan.* 1: 65. 1935.

Selected illustration. — J. Lange, l.c., pl. 29 D.

Selected description. — Arnolds, *Ecol. Coenol. Macrofungi Grassl. Heathl. Drenthe*, Netherlands 3: 399. 1982.

Differt a forma *polioleuca* stipite brevi, diametro pilei longitudine aequali vel brevior. Holotypus: *M. E. Noordeloos 1612*, Terschelling, 19 Oct. 1981 (L).

Differs from the typical form, mainly by its short stipe, which mostly is distinctly shorter than or equal to the diameter of the pileus. Besides the fusiform cystidia sometimes a second type occurs, which strongly reminds the urticiform type of cystidia (Fig. 12).

Habitat & distribution. — Terrestrial in grasslands and in stands of *Populus*. According to Arnolds (1982: 186) also in not or weakly fertilized grasslands on dry, moderately acid to neutral sand rather poor to moderately rich in humus. Frequent in coastal dunes, but also in grasslands in the province of Drenthe.

Collections examined. — NETHERLANDS: prov. Groningen: isle of Rottumeroog, 26 Oct. 1977, *E. Arnolds 3916* and *3962* (WAG-W); prov. Friesland: isle of Terschelling, West Terschelling, 19 Oct. 1981, *M. E. Noordeloos 1612* (L); prov. Drenthe: Wijster, 2 Sept. 1960, *J. J. Barkman 6657* (WAG-W); prov. Zuid-Holland: Wassenaar, 'Meyendel', 28 Oct. 1981, *M. Brand s.n.*; ditto, 2 Nov. 1981, *M. Brand s.n.*; Westvoorne, north of Tenellaplas, 14 May 1983, *C. Bas 8112*; ditto, 'Weevers duin', 18 Oct. 1982, *T. Boekhout 1045*; prov. Noord-Brabant: Bergen op Zoom, estate 'Zoomland', 1 and 2 Nov. 1973, *P. B. Jansen s.n.* (all L).

Melanoleuca polioleuca f. *langei* is similar to *M. arcuatum* sensu Ricken (1915: 356) and *M. brevipes* sensu J. Lange (1935: 65). As already stated by Arnolds (l.c.) the latter differs from the Netherlands' specimens by a whitish, thicker stipe. Within the specimens studied by me the colour of the stipe varied from pale grey-brown to dark brown (Mu. 10 YR 4–8/3). The other differences mentioned by Arnolds (l.c.) between *M. polioleuca* (as *M. melaleuca*) and *M. polioleuca* f. *langei* (as *M. brevipes* sensu J. Lange), viz. the paler, more ochraceous pileus, the slender stipe and broader cystidia in the first species, intergrade to a large extent among those forms. In this respect it is significant that J. Lange (l.c.) wrote for his *Tricholoma brevipes*: 'Rather common, . . . but often less typical than the figured species, more *melaleucum*-like.'

Melanoleuca contracta Métrod (1949: 159, nom. nud.) is related to *M. polioleuca* f. *langei*, but differs by smaller basidiocarps, pale brown lamellae and more lageniform cystidia. One of the specimens studied by me (*Boekhout 1045* (L)) differs from the others by greyish beige lamellae (Mu. 10 YR 6/4), thus agreeing in this aspect with *M. contracta*.

Other relatives are *M. phajopodia* sensu Singer & Cléménçon (1972: 326) based on an interpretation of *A. phaeopodius* Bull.: Fr. We are not sure that this taxon in the original Friesian sense (l.c.) represents a species of *Melanoleuca*, because Fries placed it in *Agaricus* subgenus *Collybia*. The specimens described by Singer & Cléménçon (l.c.) as *M. phajopodia* differ from *M. polioleuca* f. *langei* by basidiocarps becoming almost black after drying, ochraceous lamellae, slightly wider spores and the occurrence in coniferous forests.

Probably *Agaricus oreinus**Fr. (1821: 51) is also related to *M. polioleuca* f. *langei*, as Fries in 1838 (: 46) referred to a plate of *Agaricus testudineus* Pers. (Persoon, 1828: 218, pl. 23 fig. 1, 2), which represents an obese fungus with a short stipe, a grey-brown pileus, whitish lamellae and a whitish context.

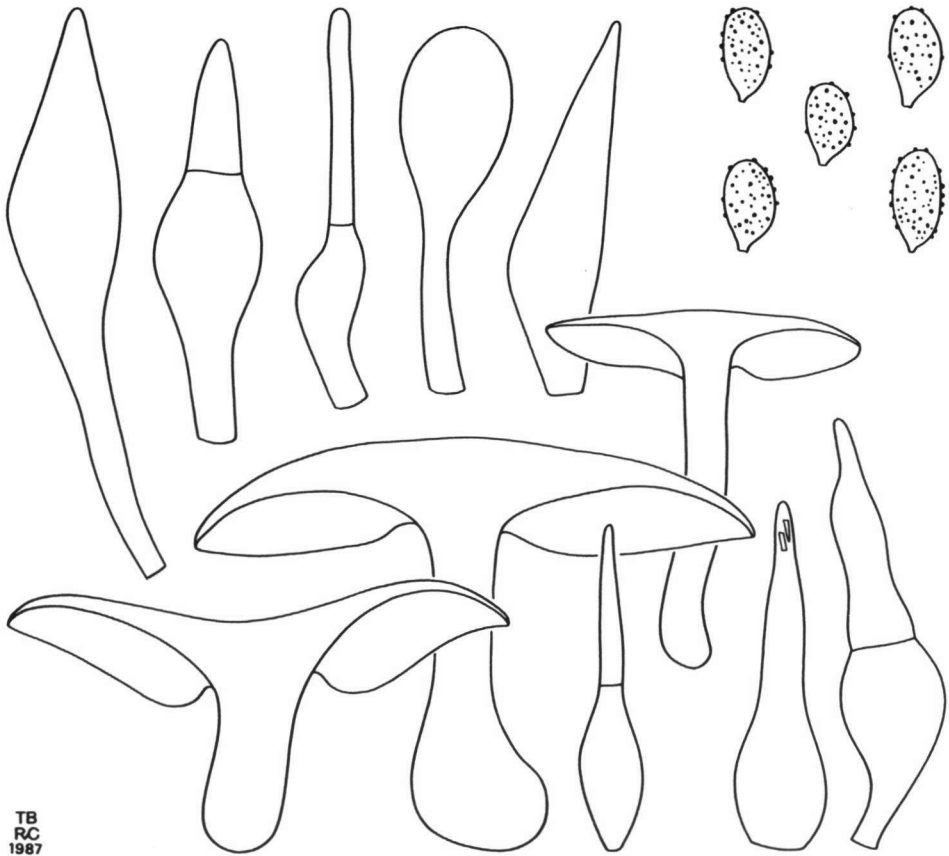


Fig. 12. *Melanoleuca polioleuca* f. *langei*. — Habit ($\times 1$). — Spores ($\times 1500$). — Cheilocystidia ($\times 1000$). — Caulocystidia ($\times 1000$).

For further discussions on this complex the reader is referred to Arnolds (l.c.).

The specimens *Métrod* 2259 (as *M. phaeopodia*) and *Métrod* 2038 (as *M. brevipes* sensu Romagnesi; both in PC) are very similar to *M. polioleuca* f. *langei*.

Melanoleuca polioleuca* f. *oreina* (Fr.) Boekhout, *comb. nov.

Agaricus oreinus Fr., *Observ. mycol.*: 98. 1815 (basonym). — *Gyrophila oreina* (Fr.) Quél., *Enchir. Fung.*: 16. 1886. — *Tricholoma oreina* (Fr.) Rick., *Blätterpilze*: 357. 1914. — *Melanoleuca oreina* (Fr.) Kühn. & Maire in *Bull. trimest. Soc. mycol. Fr.* 50: 18. 1934.

?*Agaricus humilis* var. *fragillima* Fr., *Epicr.*: 52: 1838. — *Tricholoma humile* var. *fragillima* (Fr.) J. Lange, *Fl. agar. dan.* 1: 65. 1935. — *Melanoleuca humile* var. *fragillima* (Fr.) Bon in *Docum. mycol.* 33: 78. 1978.

Differs from the typical form mainly by smaller basidiocarps. Pileus 17–35 (–45) mm, thin-fleshed, pale greyish brown (Mu. 10 YR 5/3–4), with somewhat darker centre, becoming paler on drying. Lamellae crowded to rather distant, emarginate to sinuate or occasionally even subdecurrent, whitish. Stipe 25–75 × 2–4 mm, whitish, becoming pale brown to grey-brown (Mu. 10 YR 5/4, 3/3), at apex whitish flocculose. Context of pileus whitish to pale beige, in upper part of stipe pale beige to greyish brown, towards base dark brown. Microscopical characters similar to those of typical form.

Habitat & distribution. — Terrestrial, mainly in grasslands, also in broad-leaved forests on rich soils. In the Netherlands rather common on coastal dunes, but also occurring inland in the provinces of Limburg, Utrecht, and Zuid-Holland.

Collections examined. — NETHERLANDS: prov. Friesland: isle of Vlieland, 1 Nov. 1976, *E. Arnolds* 3717 (WAG-W); prov. Zuid-Holland: Leiden, 'Hortus Botanicus', 25 Nov. 1953, *C. Bas* s.n.; Westvoorne, Oostvoorne 'Voorne's Duin', 18 Oct. 1982, *T. Boekhout* 1047 and 1048; prov. Noord-Holland: Bergen, 'Duinvermaak', 13 Nov. 1982, *Th. W. Kuyper* 2330; Castricum, watersupply dunes, 2 Nov. 1982, *Th. W. Kuyper* 2669 (all L); prov. Noord-Brabant: Dorst, 8 Aug. 1963, *P. B. Jansen* s.n. (herb. Jansen); prov. Limburg: Bemelen, 'Bemeler Berg', 30 Oct. 1982, *J. Schreurs* s.n. (L); Eijsden, 'Savels bos', 12 Aug. 1974, *P. B. Jansen* s.n. (herb. Jansen).

The specimens studied differ considerably from each other in respect to the length of the stipe and the colour of the pileus and stipe. Probably the observed differences are habitat-dependent (e.g. the length of the stipe) or age-dependent (e.g. the colour of the pileus).

Melanoleuca humile var. *fragillima* sensu J. Lange (l.c., as *Tricholoma*) agrees well with my specimens. An illustration of *M. humilis* var. *fragillima* made by Métrod (present in PC) represents our specimens very well. As stated before (see discussion on *M. turrita*). *Agaricus humilis* Persoon is considered a doubtful name. As a consequence the interpretation of Fries' *Agaricus humilis* var. *fragillima* (1838: 52, 1874: 75) is also problematic.

The description of Fries (1815: 98) of *A. oreinus* fits our specimen well. The only contradiction seems to be that according to Fries (l.c.) *A. oreinus* grows in mountainous heathlands ('Ericetis montosis'). Several authors (e.g. Quélet, 1888: 269; Kühner & Romagnesi, 1953: 148) have referred to *M. oreina* as a species related to *M. melaleuca* (non sensu Kühner) = *M. polioleuca*. *Melanoleuca oreina* (Fr.) Kühn. & Maire sensu Métrod (1942: 89) agrees fairly well with our specimens. According to Métrod's description (l.c.) the context contains hyphae with resinaceous contents. Specimens studied from the Métrod herbarium (PC), are very similar to those cited above. Only Métrod 1018,1 (PC) differs from the Netherlands' as well as from the other Métrod specimen studied by the presence of hyphae with resinaceous contents.

ACKNOWLEDGEMENTS

I would like to express my indebtedness to Dr. C. Bas for critically reading the manuscript; his numerous suggestions greatly improved its quality. Special thanks are due to Dr. W. Gams (Baarn) for drawing up the Latin diagnoses. Appreciative acknowledgement is also made to Ruth van Crevel for her care for the illustrations and to Marianne de Groot for typing the manuscript.

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